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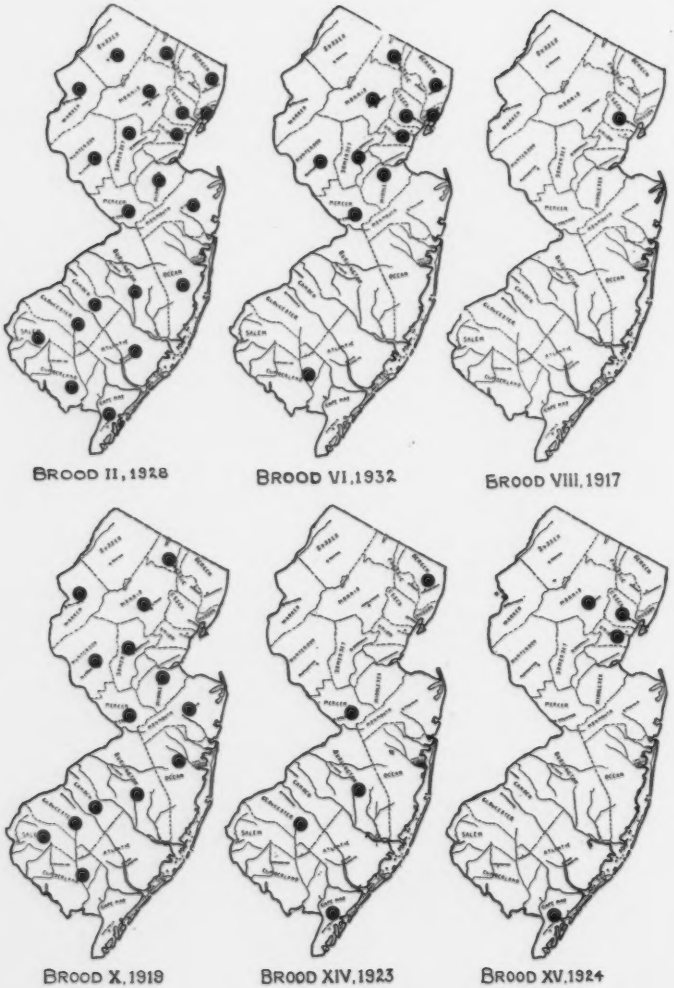

DISTRIBUTION OF THE PERIODICAL CICADA IN NEW JERSEY—WEISS.

ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

ACADEMY OF NATURAL SCIENCES, PHILADELPHIA.

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CONTENTS:

Weiss—The Distribution of the Periodical Cicada in N. J. (Hem., Hom.) 337
Abbott—New Species of Corixidae (Heteroptera) 340
Alexander—New Species of Crane-Flies from the West Indies (Tipulidae, Dip.) 343
Girault—A New Genus of Tetrastichini (Chalcidoid Hymenoptera). 348
Annual Meeting of the Ontario Society 348
Williamson—On Certain Acanthagrions, Including Three New Species (Odonata) 349
Baker—The Identity of Eriosoma querci Fitch (Aphididae, Hom.) 359
Ferris—Anoplura from Sea-Lions of the Pacific Ocean 366
Haskin—Butterflies as Food for Squirrels (Lep.) 370
Weiss—Vincetoxicum japonicum as a Mosquito Catcher (Dip.) 370
Editorial—A New Department in the News 371
New State Officials 371
Bonniwell—Location of Pupae of Megathymus cofaqui (Lep.) 372
Entomological Literature 372
Review of Oberthür—Etudes de Lepidopterologie Comparée 377
Doings of Societies—Ent. Sec., Acad. Nat. Sci., Phila. (Lepid., Odon., Hymen., Orth.) 378
Amer. Ent. Soc. (Lep., Col., Hym., Orth., Odon.) 379
Feldman Collecting Social (Coleop., Dip., Hymen.) 380
Chicago Entom. Club (Lep., Col.) .. 381
Obituary—Geoffrey Meade-Waldo 382
Frederick Enock 382
Dr. Karl Kraepelin 382
Lucas Friedrich Julius Dominikus von Heyden 383
Elie Metchnikoff 383
Ignaz Matausch 384
Sven Lampa 384
Miss Cora Huidekoper Clarke 384

The Distribution of the Periodical Cicada in New Jersey (Hem., Hom.).

By HARRY B. WEISS, New Brunswick, N. J.

(Plate XIX.)

The present information concerning the distribution of the several broods of *Tibicen septendecim* in New Jersey has been obtained from Bull. 71, U. S. Bur. Ent., by C. L. Marlatt and the reports of the entomologist of the N. J. Agric. Exp. Sta., from 1889 to 1915. Since the 1902 report of the entomologist of the N. J. Agric. Exp. Sta. by J. B. Smith, in which there appears a map showing the distribution of broods II, VI, X and XIV, no attempt has been made to bring all of the New Jersey records together in one paper or to map the distribution of each brood separately.

From Marlatt's numbering and distribution of the broods in the United States, it appears that six are present in New Jersey, these being II, VI, VIII, X, XIV and XV. Broods

II and X are the most important in point of numbers and are the best recorded. Brood VI is rather unimportant in spite of its somewhat extended distribution and brood VIII with a single record in New Jersey represents only scattered individuals. Brood XIV appears to be so considerably reduced in numbers that it amounts to almost nothing in New Jersey and the same can be said of brood XV, which, according to Marlatt, consists of retarded eastern colonies of brood XIV. Broods XIV and XV may never be reported from New Jersey in the future.

On the accompanying maps, the distribution is by counties only, these records having been obtained from Marlatt's Bull. 71 and the New Jersey reports. A more detailed distribution will be found below. In a few cases, some of the marked counties failed of confirmation in recent years. This may mean that the cicada was absent or that no reports of its occurrence were received. It was thought best however to record all counties where the insects appeared, even though some indicate old records, so that persons interested will know just where to look for them when due and so that accurate information can be obtained in the future as to whether the insects have been actually eliminated or simply overlooked. By consulting the following detailed account the exact locality can be ascertained.

DETAILED DISTRIBUTION.

BROOD II, 1877—*Union, Essex, Morris, Monmouth* Counties in large numbers; *Warren* Co., Hainesburg; *Sussex* Co., Monroe Corner.

1894—*Bergen* Co., throughout, especially from Tenafly, Carlstadt, River Vale, Mahwah. *Passaic* Co., Paterson, Greenwood Lake district. *Sussex* Co., Huntsburg and Papakating. *Morris* Co., Boonton and eastern districts. *Essex* Co., everywhere. *Hudson* Co., everywhere except flats and marshy portions. *Union* Co., everywhere. *Somerset* Co., in a few localities. *Warren* Co., Rocksburg. *Hunterdon* Co., northwestern corner. *Mercer* Co., along road to Hightstown. *Middlesex* Co., irregularly distributed, more plentiful north of Raritan River, becoming less toward south and west; along Raritan River from Perth Amboy to Bound Brook; Jamesburg. *Monmouth* Co., slight in eastern part. *Ocean* Co., in small patches; Toms River, Cassville. *Burlington* Co., in small patches; Pemberton. *Camden* Co., Pensauken, Clementon; along Camden and Atlantic and Reading Railroads

toward Atlantic County line. *Gloucester* Co., Franklinville and north of this at several places; along line of Cape May Railroad. *Salem* Co., Friesburg. *Atlantic* Co., irregular throughout; Hammonton to coast along Atlantic City Railroad. *Cumberland* Co., irregular throughout; between Bridgeton and Millville; along railroad from Vineland to Cape May County line. *Cape May* Co., throughout in large numbers, except on lowlands; plentiful at Woodbine.

1911—*Bergen* Co., from Fort Lee northward to New York State line; along top of Palisades and on both slopes; none in Hackensack valley and in low marsh areas; Rutherford, Ramsey, Westwood, Tenafly, Carlstadt, River Vale, Mahwah, Englewood, Alpine. *Passaic* Co., Paterson, Totowa, Little Falls; along line of S. & W. Railroad they extended to Morris County line; in Lake Macopin region; Hackensack. *Sussex* Co., Sparta, Newton, Huntsburg, Papakating. *Warren* Co., Washington, Hamburg, Port Murray. *Morris* Co., along line of D. L. & W. Railroad to Lake Hopatcong; Morristown, Morris Plains; from Newfoundland and Charlottesburg to Sparta along line of S. & W. Railroad; Newark watershed, Chatham, Denville, Dover to Wharton, Mendham, Millington, Mt. Tabor; north and south of Dover; Pleasant Hill in patches; Mt. Olive. *Essex* Co., infested everywhere. *Hudson* Co., Snake Hill; very little Cicada ground now remains in this county. *Somerset* Co., Washington Valley back of Pluckamin and along road to Basking Ridge; in spots from Bound Brook to Bernardsville; Somerville, Raritan. *Hunterdon* Co., High Bridge, throughout hills southeast toward Lebanon; Fairmount, Lambertville, Stockton, Ravenlock. *Union* Co., Roselle, Fanwood, Summit, Elizabeth, Springfield, Rahway; county generally covered in much reduced extent. *Middlesex* Co., New Brunswick, College Farm; from Stelton to Union County line; along north bank of Raritan River from Bound Brook to county line; Rahway to Perth Amboy; Metuchen to Perth Amboy along north bank of Raritan River; Old Bridge, Milltown, South Amboy. *Mercer* Co., between Hightstown and Yardville; Princeton. *Monmouth* Co., Matawan, Cliffwood. *Ocean* Co., around Lakewood, South Lakewood; west of Lakewood, Ridgeway. *Burlington* Co., no records. *Camden* Co., Clementon; along line of Atlantic City Railroad to Atlantic County line; Almonesson, Blue Anchor, Florence to Williamstown Junction, and along this branch to Gloucester County; Haddonfield. *Gloucester* Co., Woodbury, Malaga; along line from Williamstown to Glassboro. *Atlantic* Co., irregularly throughout on gravelly knolls or areas. *Cumberland* Co., Husted, Bridgeton; Bridgeton to Rosenhayn along Central Railroad; Vineland, along trolley line between Malaga and Newfield; Millville, irregular throughout county. *Salem* Co., between Elmer and Palatine only. *Cape May* Co., all wooded areas of peninsula in gravelly lands; Woodbine, Ocean View, Tuckahoe, Den-

nisville, Sea Isle Junction, Wildwood Junction, Seaville, Swain, South Seaville.

Brood VI, 1881—*Essex* Co., Caldwell in small numbers.

1898—*Middlesex* Co., Piscataway town. *Passaic* Co., Charlottesburg. *Morris* Co., Hanover. *Cumberland* Co., Vineland.

1915—*Union* Co., Cranford. *Essex* Co., Upper Montclair. *Passaic* Co., Oak Ridge. *Mercer* Co., Princeton.

Brood VIII, 1900—No records in Smith's reports. *Essex* Co., (Marlatt).

Brood X, 1885—*Burlington, Camden, Mercer, Middlesex, Monmouth, Morris, Passaic, Somerset, Hunterdon* Counties.

1902—*Warren* Co., southwestern corner; well covered south of Central Railroad of New Jersey and along Delaware River. *Hunterdon* Co., southern half. *Mercer* Co., pretty well distributed, except in extreme south. *Somerset* Co., not heavily visited, except at Rocky Hill; Middlebush, Martinsville, Franklin Park, Bound Brook, Raritan, Somerville, Neshanic, Three Bridges, Harlingen, Kingston. *Middlesex* Co., Piscataway town. *Monmouth* Co., highlands of Navesink, Locust Point. *Ocean* Co., New Egypt, Collier's Mill, Prospertown; between Jacobstown and Ellisdale (Burlington Co.). *Burlington* Co., Ellisdale, Indian Mills. *Camden* Co., Delaware Township. *Salem* Co., Salem, Yorktown, Woodstown. *Gloucester* Co., Swedesboro and between Swedesboro and Harrisonville. *Cumberland* Co., Shiloh; no records from Hudson, Essex, Bergen, Union, Passaic, Sussex, Cape May, Morris and Atlantic Counties.

Brood XIV, 1889—*Bergen* Co., Englewood. *Mercer* Co., Princeton. *Burlington* Co., Palmyra. *Gloucester* Co., Red Bank.

1906—No reports of occurrence except in Bergen County by Marlatt.

Brood XV, 1890—*Essex* Co. *Cape May* Co., Anglesea.

1907—*Cape May* Co. *Union* Co., Plainfield to Westfield. *Morris* Co., Newfoundland.

New Species of Corixidae (Heteroptera).

By J. F. Abbott, St. Louis, Missouri.

From time to time collections of "water-boatmen" have come in to me for determination, which have contained undescribed species. I have put these aside until such time as they might be included in a general survey of the group upon which I have been at work. But as it is the wish of those whose material I have examined, to include the names of such species in lists which they have in preparation, it seems desirable that formal descriptions of them should be published at once in order to avoid the publication of manuscript names.

1. **Arctocorisa lucida** n. sp.

Tegminal markings (typically) coalescent into solid black. Sutures marked with yellow. Head yellow. Embolium and outer portion of corium, sordid to smoky, but without markings, as if the black were condensed into the inner angle of the corium and etched away from the outer margin. Membrane smoky but without markings (or with very obscure markings). Pronotum unicolorous (in paratypes, with occasionally indications of 7-8 very narrow scratched lines). Male fovea ovate, extending to the middle of the eyes. Pala short, ligulate; 20 pegs.

The species resembles *A. kennicottii* Uhler in size and facies, but differs in the markings of the corium and the smaller number of palar pegs.

Holotype, a male from Cheshire, Connecticut, May 6, 1911 [B. H. Walden].

Allotype, a female, same data.

Paratypes from Kingston, Rhode Island, New Haven and Hamden, Connecticut, Forest Hills, Massachusetts.

2. **Arctocorisa ornata** n. sp.

Sides parallel. Head wider than pronotum. Color tawny yellow with umber markings. Surface very rastrate. Pronotum with 4-5 indefinite lines. Sutures pale. Lineations of both clavus and corium coalescent into longitudinal seriations. Membrane with a central vitta from which radiate vermiculate markings. Frontal fovea large and conspicuous, elongate ovate. Pala cultrate; pegs in a single curving, interrupted row, 18 plus 18 equal 36, in number. Length, 9 mm.; width in middle of body 2½ mm.

Holotype, a male from Ithaca, New York, August 21 [Kirkaldy coll.].

Allotype, a female from Orono, Maine, April 20, 1912 [Coll. Me. Exp. Sta.].

Paratypes from Orono and Amherst, Massachusetts, and Cheshire, Connecticut.

3. **Arctocorisa decorata** n. sp.

Yellow, with dark brown markings. Surface rastrate. Pronotal lineations, 8. Lines of clavus broad, somewhat forked; those of corium tending to coalesce into indefinite longitudinal lineations. Membrane covered with vermiculate markings, suture defined by a yellow line. Male fovea small and shallow, barely exceeding the eye. Pala falcate; pegs 37, the distal 12-14 about three times as long as the proximal. Length, 9 mm.; width, 3 mm.

Holotype, a male from Amherst, Massachusetts, August 26, 1904 [Coll. H. M. Parshley].

Allotype, a female, same data.

4. **Arctocorisa dubia** n. sp.

Surface shining, finely rastrate; chestnut brown. Pronotal lineations 8, rather broad, straight and unbroken. Lineations of clavus, corium and membrane uniformly coalescent to form a dark background with narrow flecks of lighter color. Posterior angle of corium conspicuously bordered by a V-shaped yellow band. Male fovea very shallow, not reaching middle of the eyes. Pala oblong-cultrate; pegs 27, crowded distally as in *A. interrupta, nitida,* etc. Length, 8½ mm.; width, 3 mm.

Holotype, a male from Peru, Massachusetts, August 27, 1904 [Coll. H. M. Parshley].

5. **Arctocorisa parshleyi** n. sp.

Near *alternata* Say. Lineations similar to *alternata* but color umber on a cream to ochroleucous background, approaching the typical coloration of *calva.* Width of male pala 3-7, the length (1-3 in *alternata*); pegs 29-30 (38-40 in *alternata*), along the upper margin (in *alternata,* the row starts from the middle of the base) Strigil square, small, 6 striae. Length, 6½ mm.; Width, 1¾ mm.

Holotype, a male from Providence, Rhode Island, June 18 [Davis coll.].

Allotype, a female, same data.

Paratypes from Ithaca, New York, Mercer and Orono, Maine.

6. **Arctocorisa seriata** n. sp.

Near *scabra* Abbott. Pronotum and clavus very rastrate. Coloration dark brown. Pronotal lineations 5. Those of clavus entire for the most part. Those of corium and membrane much broken and indefinitely seriate. Head yellow. Fovea deep, extending past middle of the eye. Pala very short, cultrate, about twice as long as high, with 17 pegs in an angulated row. Length, 4¾ mm.; width, 1¾ mm.

Holotype, a male from Peru, Massachusetts, August 27, 1904 [H. M. Parshley].

Allotype, a female, same data.

Paratypes from Cheshire, Hamden, and New Haven, Connecticut; Pownal, West and Orono, Maine; Kingston, Rhode Island, and Durham, New Hampshire.

7. **Arctocorisa modesta** n. sp.

Tawny yellow with brown markings; pronotum clavus and anterior half of corium strongly rastrate. Fovea elliptical, reaching middle of eye. Pala cultrate, slightly produced at base and somewhat incurved; pegs 33 in number in a single row, the distal ones slightly elongated. Pronotum subtriangular with 9 unbroken brown lines. Clavus narrowly margined with yellow, the brown lines broken, forked and confluent. Corial lineations inosculate, tending to coalesce in a vitta toward the inner margin; those of the membrane coalescing in a central fleck. Strigil minute. Length, 5 mm.; width, 1½ mm.

Holotype, a male from Piney Branch, District of Columbia, May [D. E. Clemmons].

Allotype, a female, same data.

Paratypes from Washington, District of Columbia; Plummer's Island and Great Falls, Maryland, and Charles Bridge, Virginia.

New Species of Crane-Flies from the West Indies (Tipulidae, Dip.).

By CHARLES P. ALEXANDER, Ithaca, New York.

The material upon which this paper is based is largely the property of the American Museum of Natural History and I am indebted to the curator, Dr. F. E. Lutz, for the loan of the same.

Subfamily LIMNOBINAE, Tribe *Eriopterini.*

Gonomyia (Leiponeura) helophila, sp. n. (Text figs. 1, 3.)

Male.—Length, 4.6-5.2 mm.; wing, 5-5.3 mm. Female.—Length, 4.8-5.3 mm.; wing, 5.4-5.7 mm.

Rostrum and palpi dark brownish black. Antennae with the scape dark brownish black below, yellow above; the flagellum light yellowish brown, the terminal segments blackish; flagellum with an abundant pale pubescence and very elongate hairs. Head yellow with a vertical brownish mark.

Pronotum with the scutum yellowish white, broadly grayish brown on the dorso-median area; scutellum light yellow. Mesonotal praescutum light gray with four light brown stripes; middle stripes elongate becoming confluent behind and prolonged caudad on the mid-dorsal line of the scutum; tuberculate pits far up on the cephalic margin of

* Contribution from the Entomological Laboratory of Cornell University.

the sclerite, rather closely approximated, black; pseudo-sutural foveae elongate-oval, reddish; extreme lateral margins of the praescutum whitish; scutum gray with the lobes brown; scutellum light gray, more yellowish on the caudal margin. Pleura with the dorso-pleural area light yellow extending from the pronotum to the wing-root; remainder of the pleura dark brown with two white stripes, the ventral stripe broad, clear-cut, beginning on the fore coxa extending to above the hind coxa; dorsal stripe suffused with dusky, not clear-cut, sometimes obliterated; the brown vitta separating these two white stripes well-defined. Halteres light brownish yellow passing into grayish brown on the knob which is obscurely tipped with dull yellow.

Legs with the fore coxae brown and white; middle coxae with the basal half brown, the terminal half light yellow; hind coxae light yellow; trochanters light yellow; fore femora dark brownish black; middle femora yellow, tipped with dark brown; hind femora brownish yellow, slightly darkened toward the apex; fore and middle tibiae white, the extreme base and slightly broader apex of each dark brown; hind tibiae white, the extreme base and apex light brown; fore and middle tarsi dark brownish black; hind tarsi dark brown, the basal half of the first segment whitish.

Wings with the costal margin, *Sc* and *R* china-white; remaining veins dark brown; wings subhyaline; stigma distinct, oval, brown; a vitreous spot before and beyond the stigmal spot. Venation as in fig. 1; *Sc* very short, ending far before the base of the sector, this distance about equal to from one to two times the length of the sector; *Rs* short, only a little longer than the deflection of *R*4 + 5; cell 1*st M*2 open, except in abnormal specimens where it may be closed.

Abdominal segments brown, the caudal margins broadly dull light yellow. Hypopygium as in fig. 3; dorsal appendage of the ninth pleurite fleshy without chitinized hooks or teeth of any kind, but with numerous bristles; middle appendage a very slender, somewhat sinuous hook with the apex blackened; ventral appendage prominent, the apex flattened, smooth, chitinized, the ventral angle produced into a slender finger-like lobe, the apex of which is blackened; the dorsal angle similarly produced but the lobe shorter and broader; ventral margin of the appendage with two prominent teeth whose inner margins are minutely denticulate, the tips blackened.

Habitat: Neotropical region.

Holotype: ♂, Lima, Peru; August 4, 1914; altitude 500 feet (Parish.)

Allotpye: ♀, topotypic; August 19, 1914.

Paratypes: 18 ♂ ♀, topotypic; August 4-24, 1914; 3 ♀ ♀, Bartica, British Guiana, December 31, 1912; February 4, 1913;

Mallali, March 11, 1913 (Parish); ♂, Roseau, Dominica, British West Indies, June 22, 1911 (Lutz.)

The Guiana material, represented only by females, was determined as *G.* (*L.*) *alexanderi* Johnson in my paper on British Guiana Tipulidae (Trans. Am. Ent. Soc., vol. 40, p. 242, 1914); the Peruvian specimens were determined as probably representing a new species closely allied to *alexanderi* (Trans. Am. Ent. Soc., vol. 42, p. 17, 1916.)

The two species, *G. alexanderi* Johnson (Nearctic) and *G. helophila* sp. n. (Neotropical) are closely allied and may be separated most readily by the structure of the male genitalia, these differences being expressed as follows:

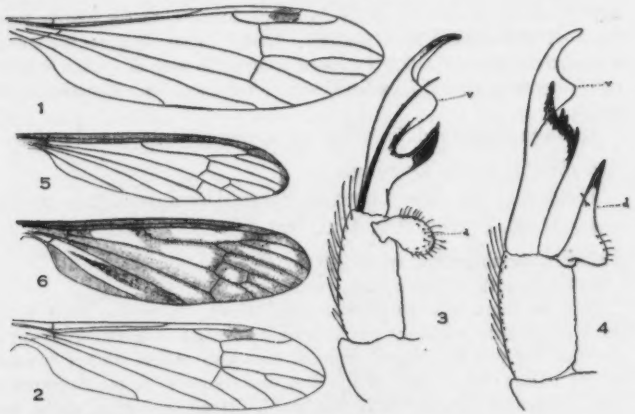

Fig. 1.—Wing of *Gonomyia* (*Leiponeura*) *helophila* sp. n.
Fig. 2.—Wing of *G.* (*L.*) *alexanderi* Johnson.
Fig. 3.—Pleurite and appendages of the male hypogygium of *G.* (*L.*) *helophila*; d, dorsal appendage; v, ventral appendage. Dorsal aspect.
Fig. 4.—The same for *G.* (*L.*) *alexanderi*.
Fig. 5.—Wing of *Eriocera aetherea* sp. n.
Fig. 6.—Wing of *Erioeera domingensis* sp. n.

Dorsal pleural appendage triangular, the caudal angle a prominent spine that is heavily chitinized apically; middle pleural appendage apparently lacking; ventral pleural appendage with a broad flattened blade. the inner caudal margin with about five or six acute, chitinized, appressed teeth of which the innermost is the largest (see figs. 2, 4). **alexanderi** Johnson

Dorsal pleural appendage a fleshy lobe bearing many hairs; middle pleural appendage a slender acute spine; ventral pleural appendage with the apex flattened, smooth, chitinized, bi-lobed; the ventral margin of the appendage with two prominent teeth whose margins are minutely denticulate (see figs. 1, 3). **helophila,** sp. n.

Tribe *Hexatomini.*

Eriocera aetherea, sp. n. (Text fig. 5.)

Male.—Length, 11 mm.; wing, 9.3 mm.

Rostrum and palpi dark brown. Antennae with the scape black, the flagellum broken. Head brownish gray.

Thoracic dorsum clear reddish orange without darker markings, the scutellum and postnotum with a very indistinct bluish cast. Pleura yellowish red. Halteres black, the base of the stem brownish. Legs with the coxae and trochanters reddish; femora black, more yellowish basally, this area narrowest on the fore legs, broader on the middle legs, the hind legs broken; tibiae and tarsi black. Wings hyaline, the costal area dark brown, this color continued around the wing as a narrow apex extending through cell R_5 of the wings; veins slender. Venation as in fig. 5.

Abdomen orange-red, including the hypopygium.

Habitat: Santo Domingo.

Holotype: ♂, San Lorenzo, Santo Domingo; June 27-29, 1915. (No. F 3785, Am. Mus. Nat. Hist.)

Eriocera domingensis, sp. n. (Text fig. 6.)

Male.—Length, 14 mm.; wing, 11 mm.

Rostrum short, reddish brown; palpi brown. Antennae short, first, third and fourth segments black; second segment subglobular, brown; flagellum beyond the second segment brownish yellow, darker toward the tip of the organ; each of the first two segments of the flagellum a little longer and stouter than the third. Head lead-gray, along the inner margin of the eye with numerous short black hairs.

Thoracic dorsum dull reddish, the mesonotal stripes just indicated, brownish red; remainder of the dorsum slightly suffused with brown. Pleura yellowish red, shiny, the mesepisternum with a large black area that is continued up to the wing-root and cephalad along the lateral edge of the praescutum; a narrow black line running from above the middle coxa across the mesepimeron to behind the wing-root. Halteres short, black, only the base of the stem a little paler.

Legs with the coxae dull reddish yellow, the outer faces suffused with black; trochanters dull yellow; femora of the fore legs dull yellow, the tip broadly dark brown, a very broad median area brownish; middle and hind femora black with an indistinct dull yellow subapical band; tibiae and tarsi black, the claws of the latter concolorous.

Wings light yellow, heavily suffused with brown, including the costal area, broad seams to all the veins and cross-veins restricting the ground-color to the central portions of the cells; apex of the wings broadly seamed with brown. Venation as in fig. 6; forks of *Rs* and *R*2 + 3 acute; the deflection of *R*4 + 5 longer than *r-m; r-m* and the deflection of *M*1 + 2 in a line.

Abdominal tergites bright orange-red, the first segment black at the base; hypopygium black; sternites yellow, trivittate with black, the median stripe interrupted, heaviest on the basal sternites.

Habitat: Santo Domingo.

Holotype: ♂, Sanchez, Santo Domingo; May 28-31, 1915. (No. F 3682, Am. Mus. Nat. Hist.)

This group of the genus will probably be found to include many species when the crane-fly fauna of the Antilles is better known. It seems to be a case comparable to that found in this same genus in Ceylon where there are in the neighborhood of a dozen species forming a peculiar group or section. There are now four species of *Eriocera* known from the West Indies and they may be separated by the following key:

1. Wings hyaline with the costal margin brown, this color running to beyond the wing-apex; (body-coloration light orange-red). (Santo Domingo). **aetherea,** sp. n.

Wings hyaline or yellowish with brown markings on the wing-disk. 2

2. Wings with three bands, the first at the wing-root, the second at the origin of the radial sector extending across the wing and connecting with the basal band in the anal cells; wing-apex largely dark, the cells *R*3, *R*5, *M*1 and *M*3 grayish hyaline in their middle portions; thorax yellowish with a grayish blue bloom especially on the pleura and coxa; abdomen with blackish bands on the anterior margins of the segments, the incisures yellowish. (Porto Rico.) **trifasciata** Röder.

Wings not trifasciate; thorax orange without grayish blue bloom; abdomen without blackish cross-bands. 3

3 Wings with an interrupted brown pattern that is ocelliform at the base of the sector; thorax orange, unmarked; legs with the coxae orange; femora yellow tipped with dark brown; claws yellow. (Porto Rico). **ocellifera** Alexander.

Wings light yellow, heavily suffused with brown, this consisting of very broad seams to all the veins; thorax orange with black spots on the pleura; legs with the coxae largely blackish; femora dark brown with a dull yellow subterminal annulus; claws black. (Santo Domingo). **domingensis,** sp. n.

A New Genus of Tetrastichini (Chalcidoid Hymenoptera).

By A. A. GIRAULT, Glenndale, Maryland.

The following genus is based on a common species in the eastern United States, namely *Euderus columbianus* Ashmead, a species very little known because of its obscure and inaccurate description.

GALEOPSOMYIA new genus.

Female: Form as in *Secodella*. Antennae inserted in the middle of the face, 11-jointed with three large ring-joints, the club 3-jointed. Scutellum with a marginal groove on each side and a median groove. Marginal vein long, the postmarginal absent, the stigmal moderately long, not a fourth the length of the marginal. Caudal tibial spur stout, single. Abdomen stout, conical, twice the length of the thorax, a little stylate at apex. Propodeum with distinct median and lateral carinae. Scutum simple, the scutellum with the three grooves as described. Mandible bidentate.

The genotype has the apex of the femora and distal third of the last two pairs of tibiae yellowish white and its color is dark metallic green or purple. Pedicel over twice longer than wide at apex, subequal to funicle 1; funicles 2-3 subequal, each somewhat shorter than 1, twice longer than wide; club 3 with a distinct terminal nipple, smaller than 1 which is a little longer than wide. Whole body densely scaly. Segments 5 and 6 of abdomen longest, 8 as long, conical.

The large size, densely scaly, stout and conical abdomen, bidentate mandibles and median groove of the scutellum should make this form easy of recognition. I have taken specimens in meadows at Glenndale, Maryland, as late as September 30.

Annual Meeting of the Ontario Society.

The Entomological Society of Ontario will hold its 53rd Annual Meeting at its headquarters in the Ontario Agricultural College, Guelph, Ontario, on Thursday and Friday, November 2nd and 3rd. There will be a goodly gathering of our Canadian members from all over the Dominion and some visitors from the United States.—CHARLES J. S. BETHUNE.

On Certain Acanthagrions, Including Three New Species (Odonata).

By E. B. WILLIAMSON, Bluffton, Indiana.

(Continued from page 324.)

Acanthagrion apicale Selys.

Abdomen: ♂, 28-30; average, 29; hind wing ♂, 19-20; average, 19.8 mm.

♂. Face in front orange, the genae paler, yellow. Labrum with median posterior impressed spot, extreme posterior edge and posterior lateral border, black or dark brown. Black on nasus variable, in palest specimens a small quadrangular black spot near the anterior border on either side; in the next darkest stage there is also a rounded median spot near the anterior border between the two quadrangular spots, this median spot connected or not with the black posterior to it on the suture; in still darker stages these three spots are more or less connected and the exterior ends of the quadrangular spots fuse with the black on the nasofrontal suture. Naso-frontal suture black, widest in the median line. The frons in front is usually slightly darker than the labrum, and rarely is obscured and much darker; in about half the specimens the black of the frons above joins the black of the naso-frontal suture in the median line. Head above black, usually with a small orange spot on either side of the median ocellus, and more rarely with a similar spot between the apex of the second joint of the antenna and the eye; postocular spots orange, orange red, or rarely yellow, about the size of an area enclosing the three ocelli, or slightly larger. Rear of head above and surrounding the foramen, black; below pale, slightly yellowish-tinged or not.

Anterior of lobe of prothorax with a large, median orange or yellow spot which nearly reaches the anterior border, reaches the posterior border, and is wider than long, in some cases reaching the lateral margins where it is more or less obscure; remainder of prothorax black. Propleuron largely brown, black above, the adjoining brown orange-tinged.

Thorax above black with an orange or orange red antehumeral stripe, slightly wider below and as wide as, or a little wider than half the black mid-dorsal stripe, which latter stripe is about equal in width to the black humeral stripe, which extends broadly across the mesinfraepisternum, leaving only the lower corner of the latter brown. A short black spur on the first lateral suture above, broadly joined above with the humeral stripe, and narrowly joined with a broad stripe about half as wide as the humeral, just in front of and parallel to the second lateral suture, this stripe narrowed above, where it overlaps the suture, and continued narrowly along the wing margin nearly across the metepimeron; below it does not quite reach the metastigma. Mese-

pimeron and metepisternum, where not black, orange or yellowish brown, duller below. Metepimeron pale bluish in a broad band parallel and adjacent to the second lateral suture, the posterior triangular area and above adjoining the wing bases to a variable extent, pigmented yellow. Beneath pale, yellowish- or greenish-tinged.

Abdomen black above; 1 with black on either side with two shallow rounded indentations in the apical half and with the extreme border black to the ventral edge; 2 with a single, similar, but deeper and more conspicuous, subapical indentation in the black which, just basal to this indentation, is wider and rounded; sides of these two segments green or greenish; 3-7 with narrow, interrupted basal rings, green on 3 and usually distinctly green or yellowish on 4 and 5, but often obscure, blue or bluish on 6 and 7 and usually not discernible in dried material; apical dorsal fourth to more than one half (usually about one-half) of 7 blue (thus differing strikingly from the descriptions of de Selys and Calvert, where 7 is described as black), this blue area wide for its entire length but narrower basally, widening apically, but not reaching the ventral edge, which is black; apical integument of 7-9, seen from the side, with a shining black spot below midheight; 8 otherwise blue, the extreme lower edge dull pale yellowish brown or with the lower edge with some traces of black which, in extreme cases, fuse to form an inferior longitudinal stripe, most developed posteriorly and fusing with the apical black spot in the integument, very rarely extending the full length of the segment; 9 similar to 8; 10 black, beneath reddish or yellowish brown. Superior appendages black, apically and posteriorly brown; inferiors dark brown or black, very restricted yellowish brown at base as seen in lateral view.

Legs dark, pale colors yellowish or greenish brown; both anterior and posterior faces of superior surface of femora black except at extreme base, more or less running out into spots basally, especially on last femora; anterior superior face of first tibiae black, other tibiae with minute lines or spots or unmarked; tarsi black, more or less pale at base of joints; tarsal claws amber, black-tipped, toothed like *"gracile."*

Wings very slightly tinged to yellowish brown-tinged, stigma dull red or reddish brown (same shade but slightly darker than in *adustum*.)

This species has been determined independently by Dr. Calvert and myself as *apicale*. Because of some differences from earlier material described by de Selys and by Calvert, I have thought it advisable to give the above description of the British Guiana specimens.

Tumatumari, British Guiana, February 7, 10 and 12, 1912, 15 males, 3 collected by A. F. Porter. Along Tiger Creek, especially on the right bank near Washerwoman Falls, are more or less extensive pools left by gold diggers. These pools are grown up with vegetation, and are very suggestive of old brick yard pools or deserted gravel pits in Indiana. However, some of these placer mining pools are very small, being only a few feet long and 2 or 3 feet wide. On the right bank of the creek below Washerwoman Falls the pools are more extensive and are immediately adjacent. Here we found both *Perithemis lais* and *thais*. *Apicale* was found about these placer pools and nowhere else. It is the handsomest *Acanthagrion* I know, and is an unusually conspicuous and alert agrionine.

Acanthagrion ascendens Calvert (Plate XVII, fig. 13).

Abdomen: ♂, 27-29; average, 28; ♀, 26.5; hind wing ♂, 17-19; average, 18; ♀, 18.5 mm.

♂. Genae, labrum and rhinarium green or olive, labrum marked as described for *kennedii*. Nasus black, yellow and green in varying proportions; the green is confined to the lateral borders, the black may form a broad crescent inside this, the horns resting at either side on the posterior edge of the nasus, the curve reaching the anterior border of the nasus in the median line, from which median part a longitudinal median black line projects backward, dividing the enclosed yellow into two spots of varying size; the horns of the crescent, in its minimum development, may not reach the posterior border of the nasus, and the longitudinal median black line may be incomplete in which case the enclosed yellow is constricted, not divided, in the median line; in the maximum development of black the green lateral borders remain, but the yellow is reduced to a small spot on either side just anterior to the posterior border, or the black may occupy even this area; in extreme cases of minimum black the black crescent consists of only three spots, one median and one on either side, the median spot with or without a posteriorly directed prolongation. Frons in front with a yellowish or greenish bar on either side as described for *kennedii;* the obliquity of these bars results in a low broad triangle of black on the lower edge of the frons, the apex of the triangle produced dorsally in the median line in a bar of black of varying width to the dorsal black of the head; usually the pale quadrangular bars are confined to the frons in front but in their maximum development (minimum black) they are extended over the frons above and, in a broad mass of

color, reach over and cover the anterior surface of the first joint of the antennae; in such a case their quadrangular shape is of course entirely lost. Corresponding to the variation in nasus and frons in front, there is decided variation in the marking of the head above; in the darkest individuals the entire head above is black, with yellow postocular spots slightly larger than a circle enclosing the ocelli; in the palest coloration the yellow markings are as follows: The pale color of the frons in front encroaches on the frons above; back of the antenna and on either side of it are two spots, the inner one of which is connected posteriorly with a spot or stripe which ends opposite and close to the lateral ocellus; there is a 3-pronged spot in front of and between the lateral ocelli, and a crescent-shaped spot in front of the median ocellus; and the occipital crest is narrowly yellow; the two spots back of the antenna may fuse with each other and with the stripe to the lateral ocellus; and the pale crescent in front of the median ocellus may fuse on either side in front with the pale color of the frons; in such a condition the head above is, of course, largely yellowish or reddish brown, depending on age and it may be described in terms of the black markings as follows: A more or less regularly elliptical median black spot on frons above; an irregular stripe starts from two points, the median ocellus and the lateral ocellus, and runs forward and outward to the edge of the frons, then turns at a right angle and runs backward and outward through the antenna to the eye; some black about the ocelli; and postocular spots black-bordered. In young males the postocular spots and any markings on the occipital crest are pale blue, the markings of the face are slaty, but the pale markings on the dorsal surface of the head are distinctly yellowish. Rear of head as in *kennedii*.

Prothorax and thorax similar to *kennedii* but with the yellow brighter and clearer on fully colored specimens. The spot on the median lobe of the prothorax is often larger; the posterior lobe may be largely or entirely pale-bordered behind, and in some cases there is a median geminate yellow spot on the median lobe. In fully colored males the antehumeral stripe is clear yellow or orange, pale blue in young specimens; the humeral black stripe is slightly less developed than in *kennedii* and is sometimes reduced on the mesinfraepisternum to an obscure line; superiorly it is narrowed from both sides, the posterior side not giving the impression of being notched as usually in *kennedii*, and the black spur or line on the first lateral suture above is weak and linear and without any tendency to fuse with the humeral stripe to enclose a pale spot. In the same way the spot above on the second lateral suture is reduced and usually no trace exists of a line parallel to the suture on the metepisternum; rarely there is a short obscure line. The sides of the thorax are much yellower than in

kennedii, except in younger individuals which are as blue as *"gracile."* Posterior triangular portion of the metepimeron heavily pigmented yellow except in younger individuals where it is blue, similar to adjacent areas. In Trinidad specimens of *ascendens* the humeral stripe is often less intense black than the dorsal stripe, tending to a reddish tinge; rarely the humeral stripe is entirely dark reddish brown, the margins, especially the posterior, not sharply defined and with black confined to the extreme upper end and a trace, if any, near the mesinfraepisternum. Such differences are not due solely to age; a pruinose male from St. Ann River, Trinidad, is the palest individual I have seen; in this specimen, head, prothorax, thorax, abdomen and legs all have the black reduced, not as readily noticed in the case of the abdomen; the legs are especially pale, the last legs with only a trace of color near the apex of the femora, the first femora with a little more than the apical half of the anterior dorsal surface dark, and the middle legs intermediate in color.

Abdomen similar to *kennedii,* but the dorsal black on 1 is narrower than on 2, and greatly constricted subapically to a varying extent, rarely reduced to a line, but usually this apical black is a stripe about one-third as wide as the basal black area anterior to it. Segment 7 black to apex with integument brown, or apex with a large semicircular blue spot which, in the midline, reaches anterior to the apical row of spines a distance equal to three to five times the length of the integument posterior to the row of spines. In brightly colored specimens the pale colors on the first six segments are all yellow or yellowish, blue first appearing on the basal ring of 7, which segment, like the preceding segments, has the sides below yellow; in duller specimens the basal rings on 4-6 are obscurely colored. Sides similar to *kennedii,* with blue more extensive on 1 (see description above of dorsal view); segments 8 and 9 blue, unmarked except for a shining black spot in the apical integument just below midheight, conspicuous only by reason of the clear blue surrounding it, or the entire lower border of 8 and 9 may be black, except the base of 8, this black broadest on 9 and, on both segments, produced dorsally in the apical integument to join the shining black spot described above; between these two extremes all intermediate stages exist; 10 black, dull orange or reddish brown beneath, in one Georgetown specimen a small round median blue spot on the side. Superior appendages black or dark brown; inferior appendages dull orange or reddish brown, darker at apex.

Legs light brown or cream-colored, paler than in *kennedii* and with more restricted dark markings; the first femora the darkest, the last the palest, dark markings confined to the dorsal surface of the femora, darkest apically, and greatly reduced or almost wanting on the last femora, some of the Trinidad specimens the palest of the series.

Wings slightly brownish-tinged or hyaline; stigma brown to dark brown or black.

♀: The female of *ascendens* has not hitherto been described; unfortunately the single specimen I took is teneral. Yellow appears only on the dorsum of the head and nasus, the postocular spots and the pale markings of the thorax and basal abdominal segments being light clear blue, just as in *"gracile."* The pattern of the dorsum of the head is pale, but the black is not reduced to the extreme degree found in some males; probably the pattern will be found to be as variable in the female as it has been shown above to be in the male.

The antehumeral blue stripe is wide; the humeral stripe is reddish brown, diffuse at the edges, black at the superior extremity, and darker below, near and on the mesinfraepisternum. There is no trace of the black spot on the second lateral suture or a dark line or stripe on the metepisternum along this suture. The metepimeron is bluish-tinged above and along the second lateral suture but fades rapidly into the cream color of the coxae and under parts.

Abdominal segments 1 and 2 patterned as in the male, the pale color light blue; 3-7 with basal rings less conspicuous than in the male; 7 with the apical integument only blue, but this will probably be found to vary in this sex as in the male; 8 with the apical third or fourth blue; 9 blue with a larger quadrangular dark spot on either side, this spot produced posteriorly at its two posterior corners, these points reaching about the middle of the segment; 10 blue; appendages brown.

Legs pale, as described for the pale males.

Wings hyaline, stigma light brown (teneral).

Georgetown, British Guiana, January 25, 26, 27 and 28, 1912, 15 ♂, 1 ♀; Paramaribo, Dutch Guiana, Feb. 23, 1912, 1 ♂; Trinidad, localities as follows, all in 1912,—Cunapo River, Feb. 27, 11 ♂; St. Joseph River, Feb. 28, March 10, 2 ♂; St. Ann River, March 1, 1 ♂; Arima, March 4, 2 ♂; Maracas River, March 5, 2 ♂; Cumuto, March 6, 1 ♂; Baracon, Chaquanas, March 7, 1 ♂.

Ascendens has hitherto been known from a single male from Cachoeira, Brazil. A male from Georgetown was sent to Dr. Calvert who confirms the identification. *Ascendens* is one of the *gracile* group in which the fully colored male (and probably older females) has departed from the ancestral blue coloration of the thorax and basal abdominal segments and has taken on green and yellow colors. The wide distribution of the species as shown by the present collection should make the

discovery of the species in some of de Selys' material not surprising. The species is a pond or sluggish stream inhabitant.

In Calvert's key to females of *Acanthagrion* (Ann. Carnegie Museum, vi, Odonata Neotropical Region, p. 162), *ascendens* runs out to C, under B, under A, in which also will fall *A. kennedii* described below. The female of *ascendens* may be recognized at once by having the mesepisternal fossae at about the midheight of the mesepisterna, the carina between the fossae, as seen in lateral view, elevated into a small semicircular prominence. In *"gracile"* and *kennedii* the fossae are placed much lower, the carina not elevated but bevelled off anterior to the fossae.

Acanthagrion "gracile" Rambur (Plate XVII, figs. 9, 12).

In view of Mr. Kennedy's work on *Acanthagrion* penes,* and because of the specific distinctness of forms otherwise scarcely separable, the true status of *gracile* and the many varieties discussed by de Selys is a matter for future determination. The following notes refer to the common Central American form determined by Calvert as *gracile* (Biol. Centr. Amer. Neurop., pp. 115, 382).

♂: In the darkest specimens the dorsum of the head is entirely black excepting the blue postocular spots and a more or less definite blue trace on the occipital crest; in the palest, the pale color on the anterior side of the first joint of the antenna is produced inward and upward to make a rounded connected spot on the frons above on either side; back of and just outside this is a spot opposite the apical end of the second joint of the antenna, and another spot between the apex of this second joint and the eye; between the median ocellus and the second joint of the antenna is another spot lying close to the ocellus..

On the middle lobe of the prothorax the blue spot on either side varies considerably in size. The black spot on the second lateral suture above is often inconspicuous, though always present so far as the present collection goes, but never produced as a line beyond the depression in which it lies.

In the extent of black on abdominal segment 1 there is considerable variation, and but little variation on 2; the black on 1 is basally about as wide as the black generally on 2, but on 1 the blue on either side encroaches subapically on the black in a triangular dorsal projection, which may fail, in varying degrees, to reach the mid-dorsal line or which may broadly meet its fellow of the opposite side, in which case

*See this volume of the NEWS, pages 325-330.

the black is reduced to a quadrate basal spot and a very narrow subapical transverse ring. The black on 2 has a similar subapical narrowing, but in this segment there seems to be but little variation, and the black is reduced only to about its width throughout the segment basal to the dilatation just basal to the subapical narrowing. The blue on the apex of 7 is variable especially on the sides; on the dorsum it varies in length but never equals the diameter of the segment; on the sides the black may reach the apex of the segment (in which case the blue is a dorsal spot) or, more generally, the black is reduced and laterally the blue occupies a greater length than dorsally, varying greatly in extent.

Wings usually hyaline, sometimes slightly tinged and in one case deeply tinged yellowish brown.

♀: Varies more in pattern of dorsum of head than does the male; the markings are yellowish above (except the postocular spots) as in the male, but in the darkest female the pattern is as described for the palest male, with the addition of a small spot in front of each lateral ocellus; in the palest female the head above is yellow, marked with black as follows: A trilobed spot in front of the median ocellus; an edging around all ocelli; a more or less indistinct irregular bar from this black edging past the apex of the second joint of the antenna to the eye; a definite border around the blue postocular spots; intermediates between the darkest and palest exist.

The humeral black stripe is more or less rusty-edged, and in one specimen it is reduced and is entirely rusty red except the extreme upper end, which remains black.

Apparently the same variation in black on abdominal segment 1 as described for the male may be expected in the female. Apex of 8 black to the transverse row of spines in only one specimen, in the others with some blue, not very variable, the integument blue in all cases. Width of dorsal blue basally on 9 not very variable but the length of the basal black on the sides more variable.

Guatemala, localities as follows, all in 1909: Puerto Barrios, May 25 and 30, 3 ♂; Morales, May 27, 2 ♂; Los Amates, June 21, 2 ♂; Gualan, June 12, 13, 16 and 18, 6 ♂, 2 ♀; Agua Caliente (on Ferrocarril del Norte), 20 ♂, 2 ♀. A common widely distributed species, in life suggesting *Enallagma exsulans*.

Acanthagrion cuyabae Calvert.

Georgetown, January 27, 1912, a single teneral male in poor condition. Dr. Calvert who examined the specimen writes of it, "In appendages, blue color and pale mid-dorsal thoracic carina more like *cuyabae fimense* than *cuyabae*, but differing

from both in the pale reddish line bisecting lengthwise the black humeral stripe; different from *fimense* in size and in black on abdominal segment 2 not narrowing anteriorly. Perhaps it is the Guianan race of *cuyabae*." In the condition of the specimen nothing more definite can be stated.

VENATIONAL CHARACTERS OF SIX SPECIES OF ACANTHAGRION, EXPRESSED IN PERCENTAGES.	apicale	ascendens	gracile	kennedii	indefensum	adustum
M_2 front wing arising at fourth postnodal						5
" " " " midway between fourth and fifth postnodals		5	20	5		5
" " " " just proximal to fifth postnodal	40	80	80	75	50	80
" " " " at fifth postnodal	40	15		10	50	
" " " " midway between fifth and sixth postnodals	10					10
" " " " just proximal to sixth postnodal	10			10		
M_2 hind wing arising just proximal to fourth postnodal	60	75	90	75		100
" " " " at fourth postnodal	40	15	10	15	100	
" " " " just distal to fourth postnodal		10				
" " " " just proximal to fifth postnodal				10		
M_{12} front wing arising at seventh postnodal		5	20			10
eighth "	60	90	80	50	100	90
ninth "	40	5		45		
tenth "				5		
M_{12} hind wing arising at seventh postnodal	50	40	70	20	100	100
" " " " eighth "	50	60	30	70		
" " " " ninth "				10		
Proximal side quadrangle front wing—about ¼ posterior side			30	80		
" " " " " " 2/7 "		100	60	20	25	
" " " " " " ⅓ "	100		10		75	100
Anterior side quadangle front wing—about ⅛-⅓ proximal side						10
" " " " " " 2/5 "					50	40
" " " " slightly shorter than proximal side	50	5	20		25	30
" " " " about equalling proximal side	20	5			25	10
" " " " slightly longer than proximal side	30	60	50	45		10
" " " " " ½ proximal side		25		50		
" " " " " ⅔ "			20	5		
" " " " " ¾ "		5	10			
Anterior side of quadrangle hind wing—1¼-1½ proximal side					50	40
" " " " 1⅖ "	20	5			25	
" " " " 1⅔ "	60	15	20			40
" " " " about twice proximal side	20	55	40	40	25	20
" " " " slightly more than twice proximal side		25	40	45		
" " " " about 2½ proximal side				15		
Arculus front wing at or scarcely distal to second antenodal	90	70	100	30	100	85
" " slightly distal to second antenodal	10	30		45		15
" " distal less than length of upper limb of arculus				20		
" " distal about the length of upper limb of arculus				5		

VENATIONAL CHARACTERS OF SIX SPECIES OF ACANTHAGRION, EXPRESSED IN PERCENTAGES.	apicale	ascendens	gracile	kennedii	indefensum	adustum
Arculus hind wing at or scarcely distal to second antenodal	70	45	90	30	50	75
" " slightly distal to second antenodal	30	45		50	50	20
" " distal less than length of upper limb of arculus		10	10	20		5
A front wing arising slightly basal to C-A crossvein					50	30
" " " at C-A crossvein.	30		20	5	50	50
" " " slightly distal to C-A crossvein	70	35	50	5		20
" " " distal to C-A crossvein less than length of the latter		65	30	10		
" " " distal to C-A crossvein at least length of the latter				80		
A hind wing arising distinctly basal to C-A crossvein						15
" " " slightly basal to C-A crossvein					25	30
" " " at C-A crossvein	30		40		50	55
" " " slightly distal to C-A crossvein	70	50	60	5	25	
" " " distal to C-A crossvein less than length of the latter		50		25		
" " " distal to C-A crossvein at least length of the latter				70		
Stigma front wing with costal side shorter than either proximal or distal side						20
" " " " about equal proximal side	40	15			50	20
" " " " longer than either proximal or distal side	60	85	100	100	50	60
Stigma hind wing with costal side shorter than either proximal or distal side						20
" " " " about equal proximal side	30	30			50	60
" " " " longer than either proximal or distal side	70	70	100	100	50	20
Stigma front wing covering much less than 1 cell				10	50	100
" " " less than 1 cell	90	90	90	90	50	
" " " 1 cell	10	10	10			
Stigma hind wing covering about ½ cell						20
" " " much less than 1 cell			20	20	100	80
" " " less than 1 cell	90	55	80	75		
" " " 1 cell	10	45		5		
Postnodals front wing 8						10
" " 9						85
" " 10		35	90		50	5
" " 11		55	10	30	50	
" " 12	50	10		55		
" " 13	30			15		
" " 14	20					
Postnodals hind wing 7						45
" " 8		5	70			55
" " 9		45	30	40	100	
" " 10	50	50		45		
" " 11	40			15		
" " 12	10					

The foregoing tabulation is based on the wings of the following number of specimens of each species: *apicale*, 5 males; *ascendens*, 10 males; "*gracile*," 5 males; *kennedii*, 10 males; *indefensum*, 2 males; *adustum*, 10 males.

The Identity of Eriosoma querci Fitch (Aphididae, Hom.).*

By A. C. Baker, Bureau of Entomology, Washington, D. C.

The species of *Anoecia* upon *Cornus* in America has for many years been considered to be *corni* Fab., of Europe. While working over the species in 1909, the writer was convinced that the American form is distinct from the European. At that time he had no European specimens and was unable, therefore, to prove or disprove his suspicions excepting by literature. Since that time he has studied specimens from several localities in France, Germany, Belgium, Russia, the Madeira Islands and Japan. All of this material and a careful study of the European literature and the forms met with in this country have proven that the American form is quite a distinct species. It, however, winters upon plants of the same genus as does the European *corni* and migrates in summer to grass roots as does the European species. The Japanese form seems to agree with the European.

It will be seen by the accompanying figures that the fall migrants of the two species are quite different. The third segment of the antennae of *corni* is armed with twelve to nineteen sensoria and these are narrow, not subcircular, in shape. The average number in all the forms examined by the writer is between twelve and thirteen. Segments IV and V have from four to six similarly shaped sensoria. The fall migrant of the American species on the other hand has usually six or seven sensoria and these are oval or almost circular in shape, very different from the narrow elongate sensoria met with on *corni* antennae. Segments IV and V have two or three sensoria and these are oval or subcircular. The spring migrant of the American species shows two or perhaps three sensoria upon Segment III. These vary greatly in size. Sometimes they will be minute and sometimes there will be one large one and one small one. Again in other specimens some will be absent altogether. This also holds true of the sensoria upon Segment IV. The early summer alate of *corni* has about six or seven

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sensoria upon Segment III, and these are oval or sometimes almost subcircular like those upon Segment III of the American fall migrant.

Another thing which should be mentioned is the absence of

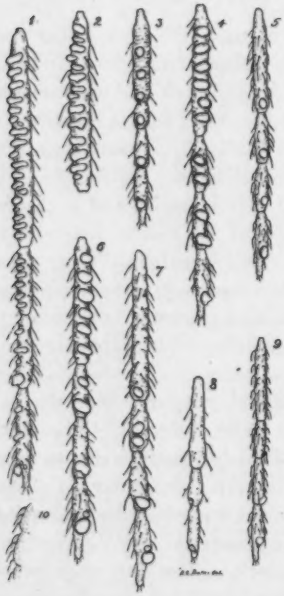

Fig. 1.—Antenna of Fall Migrant of *Anoecia corni* Fab.

Fig. 2.—Segment III of antenna of another specimen.

Fig. 3.—Antenna of Spring Migrant of *Anoecia querci* Fitch.

Fig. 4.—Antenna of Fall Migrant of *Anoecia querci* Fitch.

Fig. 5.—Antenna of Summer Aptera of *Anoecia querci* Fitch.

Fig. 6.—Antenna of Summer Alate of *Anoecia corni* Fab.

Fig. 7.—Antenna of Summer Aptera of *Anoecia corni* Fab.

Fig. 8.—Antenna of Stem mother of *Anoecia querci* Fitch.

Fig. 9.—Antenna of Summer Alate of *Anoecia querci* Fitch.

Fig. 10.—Margin of abdomen of Summer Aptera of *Anoecia querci* Fitch showing hairs.

the large quadrate patch on the abdomen of the spring migrant of the American form. In his description of the spring migrant of *corni* Koch (1857) does not mention this marking and his figure does not show it. The writer supposes, therefore, that it is absent from the spring migrant of *corni* also.

The writer has never seen European spring migrants and is therefore unable to give the number of sensoria. Judging from the American species and from the early summer form of *corni* he would suppose that it possessed about six or seven somewhat oval sensoria upon Segment III and in this way differs from the American form which possesses few sensoria.

Measurements of different forms of *corni* are here given for comparison with the descriptions of the American species also herewith included.

Fall Migrant.—
Segments of antenna: III, 0.464 to 0.512 mm.; IV, 0.16 to 0.176 mm.; V, 0.16 to 0.176 mm.; VI (0.144 to 0.176 mm. + 0.064 mm.)

Spring Aptera from Roots.—
Segments of antenna: III, 0.32 mm.; IV, 0.128 mm.; V, 0.128 mm.; VI (0.128 + 0.048 mm.).

Fall Apterous from Roots.—
Segments of antenna: III, 0.32 to 0.352 mm.; IV, 0.128 mm.; V, 0.128 mm.; VI (0.128 + 0.064 mm.).

Spring Alate from Roots.—
Segments of antennae: III, 0.32 mm.; IV, 0.128 mm.; V, 0.128 mm.; VI (0.128 + 0.048 mm.).

Since the American form proves to be distinct from *corni*, the correct name to apply to the species must be ascertained.

Two species were described by Walsh (1862). These two, *cornicola* and *fungicola*, are undoubtedly the same species as that common upon *Cornus*.

Fitch (1858) described *Eriosoma querci* from oak in Illinois, the description of which agrees fairly well with our *Anoecia* upon *Cornus*. His notes upon the species give the following collection numbers 7946-9 and 7950-1. Of these numbers 7948 was mounted from the Fitch collection by Mr. Theo. Pergande and deposited in the National Museum collection. The writer, in studying the Fitch collection, located also the numbers 7949, 7950 and 7951. These specimens were pinned and carried Fitch's labels. On mounting in balsam, all of the four specimens proved to agree with the species so common upon *Cornus*. *Anoecia querci* (Fitch), therefore, must be the name to apply to this species.

Cowen (1895) referred to *querci* Fitch a species found by him upon oak in Colorado. Later Davis (1911) gave a more complete description and figures of this same species and placed it in *Phyllaphis*. Davidson (1910) also recorded the insect from California. Gillette (1914) renamed Cowen's species *quercifoliae* and separated it from the eastern one. Specimens collected by the writer in Virginia prove that the insect referred to by Davis if not by Davidson is a very dis-

tinct species which may now be known as **Phyllaphis quercicola** n. n. It is, however, not a typical *Phyllaphis*.

While working at the Deciduous Fruit Insect Laboratory at Vienna, Virginia, the writer had the opportunity to observe the migrations of *querci* to and from *Cornus* shrubs. It is on the basis of these observations that the present paper showing the distinctness of *querci* has been written. The migration of the species from *Cornus* to grass roots was first pointed out by Osborn (1889) who placed *panicola* Thos. (1879) as a synonym of *corni* Fab. He took Oestlund (1887) as his authority for using the name *corni*, and therefore included *venusta* Pass. as a synonym of his summer form. Osborn was entirely right as far as his observations on the migration were concerned, although his presentation of the case has not been altogether followed by American writers. Recently Dr. Patch (1916) has pointed out this fact and made reference to the records (Mordwilko, 1907) of the migration of *corni* in Europe, which species she considered the same as the American. The writer believes that this retention of *panicola* Thos. is due to a lack of a sufficient knowledge of the variation of our *Cornus* species. As will be seen by the following descriptions and figures, the spring and fall migrants differ very much in antennal characters, and spring migrants vary greatly among themselves in regard to the sensoria of the antennae. The summer forms show other differences, the most important of which is the presence of prominent long curved hairs on the body. These, however, are present to some extent in the spring forms also. In some cases no sensoria are present on the third segment of the summer alate form and this might lead to its being considered a distinct species. A study of the different summer specimens has convinced the writer that *panicola* must become a synonym of *querci*. It might possibly be considered that the forms showing the prominent curved hairs are a distinct species and that the summer forms of *querci* though living upon grass roots would not show them. Since they are, however, indicated upon the spring forms there seems little doubt in the writer's mind that one species only is represented.

Thomas (l. c.) also described a species which he named *Rhizobius eleusinis*. In the Bureau collection there are specimens of this species reared by Mr. Pergande from the roots of *Eleusine indica* Gaertn. and determined by him as *eleusinis* Thos. These seem to agree in all important details with summer specimens of *querci* Fitch. The apterous forms agree well with the description given by Thomas. It seems evident then that *eleusinis* is a synonym of *querci*.

Wilson (1911) has recently described a species of *Anoecia* under the name of *oenotherae*. The principal differences between his species and *querci* are said to be the small sensoria on the antennal segments. These and the color are given as characters. As has been mentioned, the sensoria upon the spring and summer forms of *querci* vary greatly, sometimes being small and circular, sometimes large, sometimes absent altogether with the exception of the permanent ones.. The color also shows considerable variation in the main body color, though the black lateral patches are usually about the same.

The writer is inclined, therefore to believe that *oenotherae* is only another of the root-feeding forms of *querci*, which in the particular case was feeding upon *Oenothera*. That the forms do not migrate in the regular way can hardly be taken as evidence of a distinct species. The writer has summer forms of *corni* taken on wheat roots in April and it was evident that two generations at least had already lived there. In the same way, summer specimens of *querci* can be found very late in the year upon the roots of various plants, much later than the usual migration period. The proportion of the segments seems, however, to be different in the measurements given by Wilson.

Anoecia querci (Fitch)
Eriosoma querci Fitch
Rhizobius eleusinis Thos.
Schizoneura panicola Thos.
Anoecia corni, American authors.
?*Anoecia oenotherae* Wilson.

In the vicinity of Vienna, Virginia, the eggs of *Anoecia querci* hatch about the middle of April. By the end of the

month the stem mothers are mature and are producing the second generation practically all of which becomes alate. The spring migrants are in the pupal instar by about May 6. In another three or four days the migration commences and lasts until the fore part of June, a few insects becoming alate at a time. Alate forms as well as apterous are produced during the summer upon the roots of various grasses. Toward the last of September the return migration commences and extends almost to the end of October. The sexes are deposited as the alate forms arrive so that we have fresh migrants and nearly mature sexes upon the leaves at the same time. A few straggling migrants are on the trees even after the eggs are being laid. The eggs are not placed thickly upon the twigs and are many fewer than would be expected from the number of sexes present.

It may be mentioned that the writer was unable to rear this species on the flowering dogwood, but was able to get it to feed only upon the narrow-leaved dogwood which borders the streams.

Stem Mother.—Morphological characters:—Antennae composed of either six or five segments with the following measurements: I, 0.064 mm.; II, 0.064 mm.; III, 0.176 mm.; IV, 0.064 mm.; V, (0.08 + 0.032 mm.), or I, 0.064 mm.; II, 0.064 mm.; III, 0.112 mm.; IV, 0.048 mm.; V, 0.064 mm.; VI, (0.08 + 0.032 mm.). Segments armed with a few stout hairs. Eyes very small; labium short extending about to the second pair of coxae; body elongate oval, with scattered hairs, length, 1.76 mm.

Color Characters:—General color deep reddish brown, sometimes purplish or almost black. Antennae dusky; abdomen with broad transverse bands of black.

Spring Migrant.—Morphological characters:—Antennal segments as follows: I, 0.064 mm.; II, 0.064 mm.; III, 0.208 to 0.24 mm.; IV, 0.08 to 0.09 mm.; V, 0.096 to 0.112 mm.; VI, (0.08 to 0.096 + 0.048 mm.). Segments III to VI, covered with numerous imbrications composed of rows of minute points and armed with long hairs. Segment III, with 2 to 4 subcircular sensoria varying from fairly large to very minute in size. Segments IV and V with usually one sensorium each and segment VI, with one large and several small sensoria at the base of the unguis. Labium moderately long, reaching to or past the bases of the hind coxae. Length from vertex to tip of cauda about 1.7 mm.

Color Characters:—Head and thorax black; eyes deep reddish brown; antennae, legs and distal extremity of rostrum black or dusky; abdomen greenish orange or brownish green, with the cauda, anal and genital plates and a row of patches on either side of the abdomen dusky to black. No large black spot is present in the middle of the abdomen.

Summer Apterous:—Morphological characters:—Antennal segments as follows: I, 0.08 mm.; II, 0.08 mm.; III, 0.128 mm.; IV, 0.064 mm.; V, 0.08 mm.; VI (0.096 + 0.048 mm.). Segments with no sensoria excepting the usual ones, but with very many prominent hairs thickly covering all the segments. Labium extending about to the hind coxae; length from vertex to tip of cauda about 1.6 mm. Entire body covered with rather long somewhat curved hairs. Some specimens are considerably larger than the specimens measured.

Color Characters:—General color milky or pale yellowish and covered with a fine white powder. Abdomen with rows of small blackish markings along the sides and several broken dusky bands in the region of the cornicles. Antennae dusky.

Summer Alate:—Morphological characters:—Antennal segments as follows: I, 0.064 mm.; II, 0.064 mm.; III, 0.224 mm.; IV, 0.096 mm.; V, 0.112 mm.; VI, (0.08 + 0.033 mm.). Segment III, sometimes armed with two or three minute circular sensoria very much like the smaller sensoria upon the corresponding segment of the spring migrant; other sensoria normal. All segments armed with the prominent curved hairs similar to those of the apterous form. In some cases there are no sensoria present on segment III. Labium extending about to the hind coxae. Total length from vertex to cauda about 1.6 mm.; entire body covered with prominent curved hairs.

Color Characters:—Head, antennae and thorax black; abdomen whitish or pale yellowish with blackish transverse bands between the cornicles and with a large quadrate patch on dorsum. Lateral spots of the same color are present on the margins of the abdomen.

Fall Migrant.—This form and the sexes have been described by Weed (1888). Only the measurements of this form will, therefore, be given here.

Antennal Segments: I, 0.064 mm.; II, 0.032 mm.; III, 0.208 mm.; IV, 0.112 mm.; V, 0.128 mm.; VI (0.128 + 0.048 mm.). Segment III is armed with 6 to 7 subcircular sensoria; segments IV and V with usually 2 each and segment VI, with the usual large one and the small accessory ones. This form has the large quadrate patch upon the abdomen similar to that of *corni* Fab.

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Anoplura from Sea-Lions of the Pacific Ocean.

By G. F. FERRIS, Stanford University, California.

The Anopluran parasites of the seals and their allies constitute a small family, the *Echinophthiriidae*, containing less than ten species, all of which are adapted by a thick coating of spines, or spines and scales, to the aquatic life of their hosts. Opportunities for the examination of these marine mammals are not common and consequently new records are of much interest. The present paper records one Anopluran species previously described and another that appears to be new, both taken from sea-lions of the Pacific coast.

Echinophthirius fluctus n. sp.

Two mature males, a mature female and many immature

specimens taken from a stuffed skin of a sea-lion pup in the collection of the Department of Zoology of Stanford University. The skin bears no data, but the host is almost certainly the Stellar sea-lion, *Eumetopias jubata*, the range of which extends from California to Alaska.

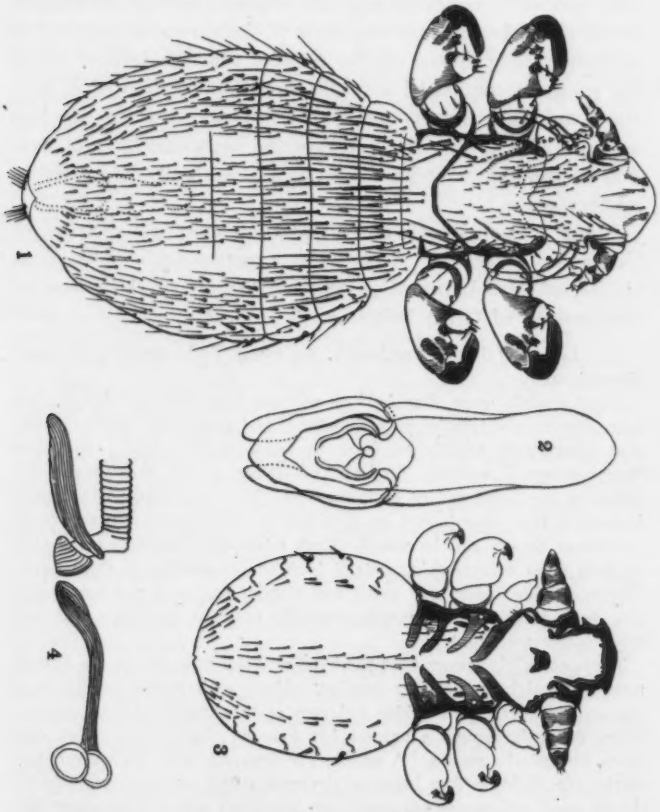

Fig. 1.—*Echinophthirius fluctus* n. sp.; female.
Fig. 2.—*Echinophthirius fluctus* n. sp.; genitalia of male.
Fig. 3.—*Echinophthirius fluctus* n. sp.; 1st (?) stage of larva.
Fig. 4.—*Echinophthirius fluctus* n. sp.; occluding apparatus of spiracle.

Through the kindness of Mr. James Waterston, of the Imperial Bureau of Entomology of Great Britain, it has been possible to compare the new species with specimens of *Echinophthirius horridus* (Olfers) (= *E. phocae* Lucas) taken from *Phoca vitulina*, a common seal of the Atlantic. The new species is very distinct, differing not only in its notably smaller size but in many structural characters as well. The extremely long spines on the temples, the slenderness of all the spines as contrasted with the short, blunt spines of *E. horridus* and the extremely small, sharp claws of the anterior legs serve to distinguish the new species immediately. It is in fact so different that it will probably eventually be placed in another genus.

Types, a mature male and a mature female, in the Stanford University collection. A paratype, a mature male, in the possession of Mr. James Waterston of the Imperial Bureau of Entomology of Great Britain.

♀. Length (cleared specimen), 2.4 mm. Body weakly chitinized throughout.

Head slightly more than half as wide as long, the anterior margin quite convex, the temples very prominent and sharp, the temporal margins converging rapidly to form the prolonged occiput. Antennae four-segmented, entirely destitute of spines except for very small spines at the distal end of each segment. The chaetotaxy of the head is entirely too complicated to describe in detail and only the more prominent details can be noted. Each temporal margin bears a pair of long stout spines which extend back to the middle of the thorax. The remaining spines are small and slender except for a transverse row, both dorsally and ventrally, near the posterior margin, which are much larger and stouter.

Thorax slightly longer than the head and but little wider, the lateral margins straight and nearly parallel. Along each lateral margin is a narrow chitinized area, which enlarges at the anterior lateral angles. From this enlargement a narrow bar extends diagonally a short distance toward the meson. A narrow, backwardly bent, transverse bar marks the dividing line between the meso- and metathorax. Mesothorax beset with numerous small, slender spines and with two or three conspicuously larger spines at each posterior lateral angle. Metathorax with a cluster of three or four small spines and two or three larger ones at each posterior lateral angle. Ventrally the thorax is beset with numerous small spines.

Anterior legs very small and with small, slender claw. Middle and posterior legs very large and stout, with large, heavy claw.

Abdomen elongated oval, widest near the middle, very weakly chitinized and thickly beset with slender spines, which are so arranged that a narrow, bare area is left on each side, about half way between the meson and the lateral margin. All the spines very slender and irregularly arranged except for a more or less regular, transverse row near the posterior margin of each of the first three segments which are conspicuously larger and stouter than the others. Chaetotaxy of the ventral side very similar. Gonopods practically obsolete, their positions marked by tufts of spines, and behind each gonopod is a thick cluster of spines.

♂. Length (cleared specimen), 2.2 mm. Very similar to the female, except for a noticeable reduction of the number of spines. Genitalia quite conspicuous, the basal plate short and rather broad, the parameres about half as long as the basal plate, rather weakly chitinized, slightly expanded posteriorly. There are no chitinous supporting structures as in *E. horridus*.

Immature stages. There are apparently three immature stages, differing from each other only in the increasing number of spines on the abdomen in each successive stage, but all differing very markedly from the mature form. In several instances the developing structures of one stage are visible within the body of the preceding stage and the sequence can thus readily be made out. Aside from the reduced number of spines all these stages differ from the adult in the extremely heavy chitinization of the skeletal elements of the head and thorax, the presence of numerous short, heavy, almost wart-like spines on head and thorax, the prolongation of the forehead and the small, weak claws. Figure 3, which is of the youngest stage found, obviates the necessity of an extended description.

Tracheal system. There are present seven pairs of spiracles, one pair on the mesothorax and six pairs on the abdomen. The segmentation of the abdomen is so faintly indicated that it is impossible to determine upon which segments the spiracles are borne (apparently they are on the third to eighth) and also, owing to the conditions under which the specimens were preserved it is difficult to speak with certainty of the distribution of the tracheal trunks. The occluding apparatus of the spiracles, however, presents some points of considerable interest.

All the spiracles, including the mesothoracic pair, are very small, so very small indeed that it is difficult to distinguish the openings. All are closed by the same type of apparatus. This consists of three chitinized pieces, a very small triangular piece that seems to border one side of the spiracle and that lies between the curved tips of two elon-

gated pieces. Apparently by some combination of muscles these long pieces can be brought to bear upon the small triangular piece, thus closing the spiracle. The arrangement of the parts is indicated in Fig. 4.

Antarctophthirius microchir (Troues. & Neum.).

A number of specimens, males, females and immature, from the California sea-lion, *Zalophus californianus,* obtained through the kindness of Mr. P. J. Fair, of the California Academy of Sciences. The species has previously been recorded from *Phocarctos hookeri,* another member of the Otariidae (Auckland Island). The description and beautiful figure given by Enderlein in the report of the Deutsche Südpolar Expedition (Vol. 10, pp. 511-512, ff. 176, 177, 183, 184) permit a definite determination of the species to be made. The California specimens differ hardly at all from those from the Antarctic.

Butterflies as Food for Squirrels. (Lep.).

The latter part of May, 1916, was noticeable in the vicinity of Los Angeles, California, for the great numbers of *Melitaea chalcedon.* On the 27th I was resting by the roadside among the willows at the upper end of Griffith Park. Great numbers of *chalcedon* were flitting up and down the road and settling on certain moist, sandy spots. Suddenly a gray ground squirrel ran out on one of these spots and apparently caught a butterfly, then sat up on its hind legs and worked over it. I tried several times to get closer, but succeeded only in scaring away the squirrel. Each time, however, it returned and went through the same performance. Finally I walked up and examined the spot, where to my astonishment I found quantities of *chalcedon* wings. To satisfy myself I counted roughly up to a hundred wings or enough for twenty-five complete butterflies. The squirrel evidently took the opportunity to obtain a meal while the butterflies were easily caught and gathered plentifully on the moist ground.—J. R. HASKIN.

Vincetoxicum japonicum as a Mosquito Catcher (Dip.).

While it is generally known that some species of female mosquitoes feed to a certain extent upon the nectar of flowers, very little has been said of the herbaceous perennial, *Vincetoxicum japonicum* and its mosquito-catching ability. It is known commonly as the mosquito plant and its small white flowers which appear in June, secrete and trap by means of a sticky nectar, various small flower-visiting flies and mosquitoes. During the past season, I have found females of *Culex pipiens* and *Aedes subcantans* firmly held fast by the flowers. It would appear from this that females of these two species occasionally feed on nectar. In addition to flies and mosquitoes different species of *Geometridae* were noted, swinging helplessly, each with the tip of its proboscis fastened in the flower. Bees have no trouble in securing the nectar and getting safely away with it as they are evidently too able-bodied to be held fast.—HARRY B. WEISS, New Brunswick, New Jersey.

ENTOMOLOGICAL NEWS.

PHILADELPHIA, PA., OCTOBER, 1916.

A New Department in the News.

We all wish to improve our methods of doing things, so that we may obtain results previously out of our reach, or that we may save time for more important things. We ourselves do not always contrive such improvements, and although someone else often devises the very thing we need, we remain unaware of his success. It has been suggested that mutual help may come by the institution of a department of "Questions and Answers" in the NEWS, whereby we shall aid each other in our problems. We shall therefore make a beginning with a question which has been submitted to us and we invite those interested to send in replies which, if brief, we shall be glad to print in the earliest possible issue of the NEWS. Other questions are also welcomed, although the Editors must, of course, reserve the right not to publish questions or answers which seem to them objectionable or inappropriate. Those sending in either questions or answers will please indicate whether they wish their names, or merely one or more initials, to appear in connection with their contributions, but all such must be accompanied by the full name and address of the writer for the information of the Editors.

I wish to ask the opinion of entomologists as to the practical use to them of a transparent mount which I have devised that will enable both sides of an insect's wings to be examined, that can be handled with perfect freedom without breakage and that can be filed like a card index in standard cabinets, giving a reference collection right at the desk and doing away with the danger of breakage incident to using specimens from the main collection.—C.

New State Officials.

Professor J. G. Sanders has recently resigned as State Entomologist of Wisconsin to become Economic Zoologist of Pennsylvania. His work at Harrisburg began September 16, 1916.

Dr. S. B. Fracker has been appointed Acting State Entomologist of Wisconsin by the Commissioner of Agriculture, and will have charge of the work of the State Entomologist's office until a successor to Professor Sanders is appointed.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

Location of Pupae of Megathymus cofaqui (Lep.).

While collecting pupae and larvae of *Megathymus yuccae* I observed in one clump of *Yucca aloefolia* where I was collecting, several pouches of what I thought were *Meg. yuccae* but I noticed they were nearly all a light colored yellow instead of black, as is common, and were located on the sides and prostrate stems of the plant—some were even on partially rotten stalks—instead of in the top of the leafy cap as is usual with *yuccae*. My first impression was that they were the pouches of new larvae and was very much surprised to find on examining them that the majority contained pupae. The pupae were much smaller and slightly different in appearance from *yuccae*. I took home a few of these pupae and some of the larvae. The larvae I kept in their sections of the food plant with the ends put in an inch or so of water, which I changed twice a week. When the pupae emerged I noticed immediately that they were different from *yuccae*, although the latter varies considerably, and after several examinations Mr. Jacob Doll pronounced them to be *M. cofaqui*. So far I have succeeded in obtaining four males and four females and I have one or two pupae and two larvae yet to hear from. The females vary quite a little but the males not so much. Mr. R. E. Ludwig, of this place, has also obtained one male *cofaqui* from a number of pupae that he supposed were *yuccae*. He states that he did not notice any difference in the pouch or position on the stem so it may be that my observations relate to some purely local condition. These pupae and larvae were obtained in the early part of March and I still have two that are in the larval state although the others have pupated and imagos emerged from the pupae. —J. G. Bonniwell, St. Petersburg, Florida.

Entomological Literature.

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded.

The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published.

All continued papers, with few exceptions, are recorded only at their first installments.

The records of papers containing new species are all grouped at the end of each Order of which they treat. Unless mentioned in the title, the number of the new species occurring north of Mexico are given at end of title, within brackets.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

4—The Canadian Entomologist. **5**—Psyche. **8**—The Entomologist's Monthly Magazine, London. **9**—The Entomologist, London. **11**—Annals and Magazine of Natural History, London. **16**—Bulletin, Societe Nationale d'Acclimatation de France, Paris. **18**—

Ottawa Naturalist. **36**—Transactions, Entomological Society of London. **37**—Le Naturaliste Canadien, Quebec. **46**—Tijdschrift voor Entomologie. **50**—Proceedings, U. S. National Museum. **56**—Mittheilungen, Schweizerischen entomologischen Gesellschaft, Schaffhausen. **68**—Science, New York. **79**—La Nature, Paris. **86**—Annales, Societe Entomologique de France, Paris. **87**—Bulletin, Societe Entomologique de France, Paris. **128**—Proceedings, Linnean Society of New South Wales, Sidney. **131**—Proceedings, South London Entomological and Natural History Society. **143**—Ohio Journal of Science, Columbus, Ohio. **153**—Bulletin, American Museum of Natural History, New York. **179**—Journal of Economic Entomology. **180**—Annals, Entomological Society of America. **184**—Journal of Experimental Zoology, Philadelphia. **189**—Journal of Entomology and Zoology, Claremont, Calif. **198**—Biological Bulletin, Marine Biological Laboratory, Woods Hole, Mass. **200**—Bulletin Scientifique de la France et de la Belgique, Paris. **229**—Trabajos, Laboratorio de Investigaciones Biologicas de la Universidad de Madrid. **240**—Maine Agricultural Experiment Station, Orono. **278**—Annales, Societe Zoologique Suisse et du Museum d'Histoire de Geneve, Revue Suisse de Zoologie. **290**—Biological Series, Michigan Geological and Biological Survey, Lansing. **322**—Journal of Morphology, Philadelphia. **324**—Journal of Animal Behavior, Cambridge. **350**—Bulletin from the Laboratory of Natural History of the State University of Iowa, Iowa City. **389**—Archivos du Museu Nacional do Rio de Janeiro. **394**—Parasitology, Cambridge, England. **407**—Journal of Genetics, Cambridge, England. **411**—Bulletin, The Brooklyn Entomological Society. **420**—Insecutor Inscitiae Menstruus: A monthly journal of entomology, Washington. **447**—Journal of Agricultural Research, Washington. **480**—The Annals of Applied Biology. **509**—Revue Generale des Sciences pures et Appliquees, Paris. **519**—The Scientific Monthly, Lancaster, Pa. **524**—Technical Bulletins, Entomology, University of California, Berkeley. **529**—Journal of Zoological Research, London. **531**—Boletin, Direccion de Estudios Biologicos, Mexico. **532**—Proceedings, National Academy of Sciences of the United States of America, Washington. **533**—Memoirs, American Entomological Society. **534**—Proceedings, California Academy of Sciences, San Francisco. **535**—Annual Report, State Entomologist of Indiana.

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Dixey, F. A.—Seasonal dimorphism, **131,** 1915, 1-14. **Dow, R. P.**—Plaster-casting insect burrows, **5,** 1916, 69-74. The testimony of the tombs, **411,** xi, 25-33. **Felt, E. P.**—American insect galls. **18,** xxx, 37-39. **Herrera, M.**—La inteligencia y el instinto de los insectos, **531,** i, 389-98. **Janet, C.**—Constitution metamerique de l'insecte, **56,** xii, 354-67. **Lameere, A.**—La metabolie des insectes, **509,** xxvii, 370-76. **Meade-Waldo, G.**—Obituary notice, **4,** 1916, 196. **Moore, W.**—How gases enter insects, **180,** ix, 224-6. **Pergande, T.**—Obituary notice, **4,** 1916, 213-4. **Shannon, H. J.**—Insect migrations as related to those of birds, **519,** iii, 227-40. **Slosson, A. T.**—Entomology and literature, **411,** xi, 49-52. **Swynnerton, C. F. M.**—Experiments on some carnivorous insects, especially the driver ant Dorylus, and with butterflies' eggs as prey, **36,** 1915, 317-50. **Wells, B. W.**—The comparative morphology of the Zoocecidia of Celtis occidentalis, **143,** xvi, 249-98. **Williams, J. B.**—Obituary notice, **4,** 1916, 248. **Woglum, R. S.**—A handy field and laboratory binocular magnifier, **179,** ix, 370-1.

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NEUROPTERA, ETC. Evans, A. T.—Dragonflies of the Douglas lake region, Michigan, **290,** Pub. 20, 39-60. **Hood, J. D.**—Oedaleothrips hookeri, a new genus and sp. of Thysanoptera, **411,** xi, 64-5. **Ris, F.**—Ueber ontogenese der flugeladerung bei den Libellen, **56,** xii, 328-32. **Tillyard, R. J.**—On the development of the wing-venation in Zygopterous dragonflies, with special reference to the Calopterygidae; On the physiology of the rectal gills in the larvae of anisopterid dragonflies, **128,** xl, 212-30; 422-37. **Walker, E. M.**—The nymphs of Enallagma cyathigerum and E. calverti, **4,** 1916, 192-6. **Wildermuth, V. L.**—California green lacewing fly, **447,** vi, 515-25.

Folsom, J. W.—North American collembolous insects of the subfamilies Achorutinae, Neanurinae and Podurinae [many new], **50,** l, 477-525. **Hood, J. D.**—A synopsis of the genus Oxythrips [1 new], **420,** iv, 37-44.

ORTHOPTERA. Bordage, E.—Phenomenes histologiques de la regeneration des appendices autotomises chez les orthopteres pentameres, **200,** xlix, 199-35. **Bugnion, E.**—Les pieces buccales de la Blatte (Blatta americana et australasiae), **56,** xii, 383-400. **Burr, M.**—The opisthomeres and the gonapophyses in the Dermaptera, **36,** 1915, 257-73. **Carl, J.**—Acridides nouveaux ou peu connus du Museum de Geneve, **278,** xxiv, 461-518. **Crampton, G. C.**—A comparative study of the maxillae of the Acridiidae, Phasmidae and Phylliidae, **5,** 1916, 83-7. **Foucher, G.**—Etudes biologiques sur quelques orthopteres, **16,** 1916, 263-73 (cont.). **Turner, C. L.**—Breeding habits of O., **180,** ix, 117-135.

HEMIPTERA. Cogan, E. S.—Morphological studies of the superfamily Jassoidea, **143,** xvi, 299-325. **Dietz & Morrison**—The coccidae or scale insects of Indiana, **535,** viii, 191-321. **Ewing, H. E.**—Eighty-seven generations in parthenogenetic pure line of Aphis avenae, **198,** xxxi, 53-112. **Ferris, G. F.**—A catalogue and host list of Anoplura, **534,** vi, 129-213. **Horsfall, J. L.**—Additions to the Jassoidea of Missouri, **143,** xvi, 354-5. **Lees, A. H.**—Some observations on the egg of Psylla mali, **480,** ii, 251-7. **Maulik, S.**—The respiratory system of Nepa cinerea, **529,** l, 41-58. **Osborn, H.**—Studies of life histories of leafhoppers of Maine, **240,** Bul. No. 248, 53-80.

Drake, C. J.—A new tingid from Tennessee, **143,** xvi, 326-8. **Quaintance & Baker**—Aleyrodidae, or white flies attacking the orange, with description of three new sps. of economic importance, **447,** vi, 459-72. **Van Duzee, E. P.**—Monograph of the No. Am. sps. of Orthotylus [many new], **534,** vi, 87-128. **de la Torre Bueno, J. R.**—A new tingid from New York state; The Veliinae of the Atlantic states [4 new], **411,** xi, 39-40; 52-61.

LEPIDOPTERA. Dognin, P.—Heteroceres nouveaux de l'Amerique du Sud, Fasc. IX-X. **Essig, E. O.**—A coccid-feeding moth (Holococera iceryaeella), **179,** ix, 369-70. **Hampson, G. F.**—Descriptions of new Pyralidae of the subfamilies Epiposchianae, Chrysauginae, Endotrichinae and Pyralinae, **11,** xviii, 126-160 (cont.). **Holloway, T. E.**—Larval characters and distribution of two sps. of Diatraea, **447,** vi, 621-26. **Johnson, C. W.**—Parasites of Archips cerasivorana, **5,** 1916, 81. **Joicey, J. J.**—New South-American Arctiadae, **11,** xviii, 53-62. **Meijere, J. C. H.**—(See under Diptera).

Mosher, E.—The classification of the pupae of the Saturniidae, **180,** ix, 136-58. **Pearsall, R. F.**—Operophtera (Rachela) bruceata, **411,** xi, 68-9. **Tower, D. G.**—Comparative study of the amount of food eaten by parasitized and nonparasitized larvae of Cirphis unipuncta, **477,** vi, 455-58. **Welch, P. S.**—Contribution to the biology of certain aquatic L., **180,** ix, 159-90. **Whittle, F. G.**—L. collected on a trip around the world, **9,** 1916, 135-9 (cont.). **Woodlock, J. M.**—Some experiments in heredity with Abraxas grossulariata and two of its varieties, **407,** v, 183-7.

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DIPTERA. Cory, E. N.—Notes on Pegomyia hyoscyami, **179,** ix, 372-5. **Dyar & Knab**—Eggs and oviposition in certain species of Mansonia, **420,** iv, 61-8. **Evans, A. T.**—Some observations on the breeding habits of the common house fly (M. domestica), **179,** ix, 354-62. **Graham-Smith, G. S.**—Observations on the habits and parasites of common flies, **394,** viii, 440-544. **Knab, F.**—Dispersal of some Ortalidae, **411,** xi, 40-46. The earliest name of the yellow fever mosquito, **420,** iv, 59-60. **Malloch, J. R.**—A comparison of the pupae of Promachus vertebratus and P. fitchi, **411,** xi, 66-8. **Meijere, J. C. H.**—Zur zeichnung des insekten-, im besonderen des dipteren- und lepidopteren-flugels, **46,** lix, 55-147. **Parker, R. R.**—Dispersion of Musca domestica under city conditions in Montana, **179,** ix, 325-54. **Townsend, C. H. T.**—Muscoid flies from the southern U. S., **420,** iv, 51-59.

Banks, N.—Synopsis of Zodion and Myopa with notes on other Conopidae [13 new], **180,** ix, 191-200. **Cole, F. R.**—New sps. of Asilidae from So. California [6 new], **5,** 1916, 63-9. **Dyar, H. G.**—Mosquitoes at San Diego, Calif. [1 new], **420,** iv, 46-51. **Johnson, C. W.**—Some New England Syrphidae [3 new], **5,** 1916, 75-80. **Shannon, R. C.**—Two new N. Am. D., **420,** iv, 69-72. **Van Duzee, M. C.**—Table of males of the N. Am. species of the genus Asyndetus with descriptions of six n. sps., **5,** 1916, 88-94.

COLEOPTERA. Beaulue, J. I.—Les coleopteres du Canada, **37,** xliii, 10-16 (cont.). **Bernhauer & Schubert**—Coleopterorum catalogus, Pars 67, Staphylinidae V, pp. 409-498. **Champion, G. C.**—Notes on Melandryidae, **8,** 1916, 144-157. **Clausen, C. P.**—Life history and feeding records of a series of California Coccinellidae, **524,** 1, 251-99. **Harris, J. A.**—The habits in oviposition of the beetle Bruchus, **324,** vi, 325-6. **McIndoo, N. E.**—The reflex "bleeding"

of the coccinellid beetle, Epilachna borealis, **180,** ix, 201-23. **d'Orchymont, A.**—Notes pour la classification et la phylogenie des Palpicornia, **86,** lxxxv, 91-106. Observations sur le mode de respiration de quelques Palpicornia aquatiques, **87,** 1916, 139-41. **Runner, G. A.**—Effect of rontgen rays on the tobacco, or cigarette beetles...., **447,** vi, 383-88. **Schaeffer, C.**—New sps. of Throscidae [3 new], **411,** xi, 62-3.

Angell, J. W.—Two new lucanids from No. America, **411,** xi, 70. **Fall, H. C.**—New N. Am. species of Notoxus [7 new], **411,** xi, 33-38. **Swaine, J. M.**—New sps. of the family Ipidae [7 new], **4,** 1916, 181-92. **Wickham, H. F.**—New fossil C. from the Florissant beds [many new], **350,** vii, No. 3, 20 pp.

HYMENOPTERA. Cornetz, V.—Sur l'orientation chez des fourmis, **278,** xxiv, 519-20. **da Costa Lima, A.**—Consideracoes sobre a campanha contra a formiga sauva (Atta sexdens); Sobre alguns Chalcidideos parasitas de sementes de Myrtaceas, **389,** xix, 179-192; 193-203. **Cresson, E. T.**—The Cresson types of Hymenoptera, **533,** No. 1, 141 pp. **Frison, T. H.**—Note on the habits of Psithyrus variabilis, **411,** xi, 46-7. **Holland, E. B.**—Detection of arsenic in bees, **179,** ix, 364-6. **Lutz, F. E.**—The geographical distribution of Bombidae, with notes on certain sps. of Boreal America, **153,** xxxv, 501-21. **Meade-Waldo, G.**—Notes on the Apidae in the collection of the British Museum, with descriptions of n. sps., **11,** xvii, 448-70.

Andrews, H.—A new ant of the genus Messor from Colorado, **5,** 1916, 81-3. **Cockerell, T. D. A.**—Some Rocky Mts. andrenid bees [2 new], **4,** 1916, 252-4. Descriptions and records of bees [1 new], **11,** xvii, 428-35. New and little known bees from California [27 new; 1 n. gen.], **189,** viii, 43-64. **Girault, A. A.**—Descriptions of and observations on some Chalcidoid H. [7 new]; A new gen. of pteromalid chalcidoid H. from N. Am. [2 new], **4,** 1916, 242-46; 246-48. **Timberlake, P. H.**—Revision of the parasitic H. insects of the genus Aphycus, with notice of some related genera [many new], **50,** I, 561-640.

ETUDES DE LEPIDOPTEROLOGIE COMPAREE, by CHARLES OBERTHÜR, Rennes, France. Volume eleven of this important work has been recently issued. It is in two parts, the first consisting of text and portraits of Lepidopterists, and the second comprises the colored plates. There are 288 pages and twelve portraits. One hundred and seventeen pages are devoted to tropical American Rhopalocera of the genera *Catagramma, Callicore* and *Perisama,* and a number of new species are described. Several pages are occupied by historical matters in relation to the war of 1870 and then some of the Lepidoptera of Madagascar

are studied. Interesting studies of the genitalia of *Acraea* are given with figures of the organs of generation. Certain species of the Lycaenidae, Satyridae and Hesperidae are studied and figured, and among the Heterocera certain species of Agaristidae, Saturnidae, Noctuidae and Nyctemeridae. The fifth part of the text is devoted to biological observations by M. G. Melou. The volume closes with remarks by M. Oberthür.

There are fifty-six colored plates with 448 illustrations. These plates for accuracy and beauty have never been surpassed and seldom equalled. Of these many illustrations, 185 are devoted to the tropical American genera *Catagramma, Callicore* and *Perisama.* They are now on a much firmer basis for study as not much has been added to our knowledge of these butterflies since the time of Hewitson. The geographical individual variation is quite remarkable and is well shown by Mr. Oberthür in the *excelsior* group, where the undersides of the insects are practically alike, and the uppersides show much variation. It is always a pleasure to see a volume of the *Etudes* appear.—HENRY SKINNER.

Doings of Societies.

Entomological Section, Academy of Natural Sciences of Philadelphia.

Meeting of December 13, 1915. Seven persons present, Dr. Philip P. Calvert presiding. The annual reports were read. Mr. Wm. T. Davis was elected a member. The following were elected officers for 1916; *Director,* Philip Laurent; *Vice Director,* R. C. Williams, Jr.; *Treasurer,* E. T. Cresson; *Conservator,* Henry Skinner; *Secretary,* J. A. G. Rehn; *Recorder,* E. T. Cresson, Jr.; *Publication Committee,* E. T. Cresson, E. T. Cresson, Jr., P. P. Calvert.

Lepidoptera.—Mr. R. C. Williams, Jr., exhibited specimens of the chrysalids of *Lycaena sonorensis.*—HENRY SKINNER, *Recorder.*

Meeting of January 27, 1916. Eleven persons present. Director Philip Laurent presiding. Prof. C. E. McClung and Dr. Witmer Stone were elected members.

Dr. Skinner complained of the pernicious use of the pest-breeding cigar boxes by many collectors and students. He also spoke of the power of naphthalene in keeping collections free from museum pests, and exhibited specimens collected in 1835 by Maj. John E. LeConte, which are still in good condition.

Odonata.—Dr. Calvert, commenting on an article by Alfred Warren, entitled "A Study of the Food Habits of the Hawaiian Dragon flies or Pinau" (Bulletin No. 3, College of Hawaii), called attention to the proportion of the various orders of insects devoured. He ex-

hibited the illustrations—charts showing these proportions of which the Diptera represented nearly one-half of the total. He also remarked on his own experience along this line. Mr. Baylis said that he had caught a dragonfly in the act of devouring a *Vespa maculata*.

Meeting of March 23, 1916. Seven persons present, Mr. Morgan Hebard presiding. Mr. William S. Huntington was elected a member.

Hymenoptera—Mr. G. M. Greene exhibited a specimen of *Atta cephalotes*, collected Aug. 9, 1911, at Chaco, Argentine Republic. Dr. J. C. Bradley exhibited some Mutillidae, calling attention to some structural characters which he discovered to be very constant and much more satisfactory than the color characters. In working out these characters he found that there are several distinct forms contained within the limits of some of the present species as based upon the color characters.

Orthoptera.—Mr. Rehn exhibited a box of striking species of tropical American Tettigoniidae and Mantidae chiefly from Costa Rica. Three of the species shown are undescribed and two of the genera have not been recorded from Central America. He made a few remarks on the specimens shown.

Mr. Hebard spoke of the high prices asked by foreign dealers for such striking insects, while the more inconspicuous specimens, even if they are types, may be purchased at a proportionately much lower price.—E. T. Cresson, Jr., *Recorder*.

American Entomological Society.

Meeting of February 24, 1916, at the Academy of Natural Sciences of Philadelphia, Dr. Henry Skinner, President, in the chair. Ten members present. Dr. Witmer Stone was elected a member.

Lepidoptera. Dr. Calvert reported the presence of fragments of insects on the silk larval cases of a lepidopterous insect in bag worms from Costa Rica (see also below). He also reported having seen sleeping clusters of *Heliconius charitonius* there. Dr. Skinner exhibited a photograph of some of the types of the American species of the genus *Parnassius*.

Coleoptera. Dr. Skinner exhibited a specimen of *Megasoma elephas* ♀ and also a live ♂; both were brought in alive by an officer of the United Fruit Co.; they were fed on bananas; attention was called to the great strength of this insect as exhibited by the living example.

Hymenoptera. Prof. Bradley reported that in 1907, in an arid district in California, he found Hymenoptera sleeping in clusters, there being five species so found; they attach themselves by their mandibles, their bodies and hind legs being extended.

Orthoptera. Mr. Rehn made a few remarks on asymmetry in the

genital plates and appendages of certain roaches. He also called attention to the great extent to which sexual dimorphism is developed in the same group, illustrating this point by specimens. Dimorphism and polymorphism within the male sex in several species of roaches was also mentioned.

Meeting of April 27, 1916, Dr. Henry Skinner presided. Twelve members present. Mr. William S. Huntington was elected a member.

Lepidoptera. Dr. Skinner exhibited the imago of the Hesperid, *Megathymus yuccae,* which emerged from the larva in the yucca plant secured by Dr. Castle, May 20, at Enterprise, Florida (see Ent. News, xxvii, 45). Mr. Laurent recorded his capturing a ♂ and ♀ *M. yuccae,* in March, 1907, at Melbourne, Florida. Dr. Calvert, referring to his remarks at the previous meeting on larval cases, reported that he had examined more of these, and had found the conditions to be the same in all; he believed, however, that the portions of insects so attached to the cases, were not from insects captured alive by the larvae, but were more likely fragments of dead insects, found and so attached by it.

Orthoptera. Mr. Rehn called attention to and read extracts from an interesting paper by Mr. E. D. Ball on "Estimating the number of Grasshoppers" (Jour. Econ. Ent., viii, No. 6, 1915). He exhibited the Academy's series of the gigantic Katydids of the Group Steirodontes, including all but two of the known genera, and comprising half of the known species of the genera represented. The rarity of certain of the species in collections was commented upon, and remarks on the distribution of the forms of the *marginella* group of the genus *Stilpnochlora* illustrated. Mr. Laurent exhibited a grasshopper (*Romalea microptera*) impaled on a twig of pecan tree probably done by a shrike or butcher bird (Laniidae); this was collected by him at Gulf Hammock, Levy County, Florida, March 15, 1916.

Odonata. Dr. Calvert exhibited *Gomphus amnicola* Walsh, ♂ Marysville, Pennsylvania, July 14, 1912; ♀ Harrisburg, Pennsylvania, July 9, 1910, by H. B. Kirk. The only previous eastern record is from Bethlehem, New York, 1870. *Gomphus quadricolor* Walsh, one ♂ Heckton Mills, Dauphin County, Pennsylvania, June 15, 1909, by H. P. Bailey; two more (supposedly local) individuals of the latter species, from the Academy's collection, with insufficient labels were also shown, leading to remarks by several members on the importance of accurately labeling all captures.

R. C. Williams, Jr., *Secretary.*

Feldman Collecting Social.

Meeting of April 9, 1916, at the home of H. W. Wenzel, 5614 Stewart Street, Philadelphia. Twelve members were present. President H. A. Wenzel in the chair.

Coleoptera. Mr. Kaeber exhibited a specimen of *Ligyrus rugiceps* LeC., which he collected at light, Philadelphia Neck, July 19, 1915. Mr. H. W. Wenzel exhibited two boxes of about a thousand specimens of Aleocharinids, which were collected by the Wenzels, Senior and Junior, the past summer; he showed a funnel arrangement containing a wire mesh, the funnel fitting in the neck of a cyanide bottle, and when fungi are placed in the funnel the staphylinids drop through the wires into the bottle.

Diptera. Mr. Daecke exhibited a specimen of *Promachus rufipes* Fabr., collected by Morgan Hebard, at Cedar Springs, New Jersey, August 26, 1914. This is new to the State.

Adjourned to the annex.

Meeting of May 17, 1916, at the same place. Twelve members and one visitor present. President H. A. Wenzel in the chair.

Diptera. Mr. Hornig stated he had seen the first live local larvæ of *Aedes canadensis* Theob. on April 13, and of *A. sylvestris* Theob. on April 21. Mr. Daecke exhibited some leaves from an oak tree near Conewago, Pennsylvania, May 13, which with the rest of the leaves on this tree had the edges rolled up and browned; these contain Cecidomyid larvæ.

Coleoptera. Mr. Haimbach said he had seen the first *Lachnosterna* at light on his place, Homebrook, Narberth, Pennsylvania, on May 1. Mr. Laurent said he had collected many *Silpha* on a dead hog in Levy County, Florida, this spring after the buzzards finished with it and was surprised to notice that many of them had a small piece missing from the edge of one elytron, and in most cases the right one; *S. americana* Linn. and *inaequalis* Fabr. were exhibited showing this. Mr. H. W. Wenzel exhibited *Pseudocleis picta* Rand. and both its varieties, *minor* Casey and *hudsonica* Casey.

Coleoptera and **Hymenoptera.** Mr. Daecke exhibited three galls from *Pinus americanus*, collected at Rockville, Pennsylvania, April 16, 1916, from which on April 30, 1916, one *Podapion gallicola* Riley emerged with two small Hymenoptera, presumably parasites of same.

Adjourned to the annex.

GEO. M. GREENE, *Secretary.*

Chicago Entomological Club.

Meeting of March 19, 1916, at home of Mr. Emil Beer. Seventeen members present.

Lepidopterists had the Sesiidae as a subject and compared specimens. Local captures reported were: *Melittia satyriniformis* feeding in melon vines, *Podosesia syringae* feeding in ash and lilac, *Memythrus tricinctus* feeding in poplar, *Memythrus asilipennis* feeding in oak

stumps, *Memythrus dollii* feeding in poplar, *Bembecia marginata* feeding in raspberry roots, *Sesia tipuliformis* feeding in currant, *Sesia pictipes* feeding under bark of cherry trees, *Sesia albicornis* feeding in willows, *Sesia acerni* feeding in maple, *Sesia corni* and two or three others not satisfactorily identified.

Coleopterists had the Hydrophilidae as a subject and compared specimens. A. KWIAT, *Secretary.*

OBITUARY.

GEOFFREY MEADE-WALDO, in charge of the Hymenoptera at the British Museum of Natural History since 1909, died very suddenly on March 11, 1916, of the after-effects of an attack of pneumonia. He was born in January, 1884, educated at Eton and at Oxford, took part in the cruise of Lord Crawford's "Valhalla" to the Malay Federated States and Borneo in 1907-08 and had published on various groups of Hymenoptera in the *Annals and Magazine of Natural History* and in the *Transactions of the Entomological Society of London.* Obituary notices in *The Entomologist* for April and *The Entomologist's Monthly Magazine* for May, 1916, give further particulars.

FREDERICK ENOCK, known for the beauty of his microscopical preparations and for his studies of those minute Hymenoptera, the Mymaridae, died at Hastings, England, May 26, 1916. He was born at Birmingham, April 17, 1845. In 1887-88 he engaged in a controversy with Prof. C. V. Riley respecting the Hessian Fly. According to an obituary notice in the *Entomologist's Monthly Magazine* for July, 1916, he leaves a number of manuscripts and photographs illustrative of undescribed Mymaridae.

DR. KARL KRAEPELIN, Director of the Natural History Museum at Hamburg since 1889, who died June 28, 1915, was the author of memoirs on the structure, mechanism and development of the sting of bees (1873), the anatomy and physiology of the proboscis of *Musca* (1883), of the sections on Scorpions and on Palpigrades in *Das Tierreich* and of other

entomological contributions. He was born in Neustrelitz, December 14, 1848, and studied at Göttingen and Leipzig. A brief notice of his life, chiefly from the geographer's standpoint, is given in *Petermann's Mitteilungen*, lxi, 315.

Lucas Friedrich Julius Dominikus von Heyden, who died September 13, 1915, at Frankfurt am Main, is the subject of an appreciative obituary notice and portrait in the *Entomologische Blätter* (Berlin) for December 30, 1915. Von Heyden was born in Frankfurt, May 22, 1838, and spent most of his life in that city, although he made entomological excursions into Spain, Portugal, Croatia, Slavonia and Bosnia, as well as in the neighborhood of his home. His associates included Reitter* and Hopffgarten, the coleopterists, Saalmüller (whose work on the Lepidoptera of Madagascar he completed), Moritz Schmidt, Oskar Böttger and Albrecht Weiss. He devoted himself chiefly to palaearctic insects, accumulating a collection of 20,000 species, chiefly Coleoptera. By an agreement with the late Dr. Kraatz, his beetles go to the German Entomological Museum in Berlin; his other insects he presented to the Senckenberg Naturforschenden Gesellschaft in Frankfurt, which in June, 1911, established the Karl and Lucas von Heyden Fund (after father and son), of 50,000 marks, the income of which is expended for scientific publications. Von Heyden was the author of more than 350 papers and was very generous in loaning material from his collection to various specialists.

Elie Metchnikoff, who died in Paris, in an apartment of the Pasteur Institute, of which he was Sub-director, on July 15, 1916, was chiefly known in recent years for his researches into the causes of old age, into various human diseases and into the functions of the white blood corpuscles. But as a note in the News for February, 1915 (page 83), pointed out, he had, in the third decade of his life, devoted much time to investigations on the terrestrial Arthropods. Such were his

*Edmund Reitter celebrated his 70th birthday on Oct. 22, 1915.

Embryologische Studien an Insecten (1866), *Untersuchungen über die Embryologie der Hemipteren* (1866), *Embryologie des Scorpions* (1871), *Entwicklungsgeschichte des Chelifer* (1871), *Embryologie der doppeltfüssigen Myriopoden* (*Chilognatha*) (1874) and *Embryologisches über Geophilus* (1875); all of these memoirs appeared in the *Zeitschrift für wissenschaftliche Zoologie*. His *Untersuchungen über die intracelluläre Verdauung bei wirbellosen Thieren* (Arb. Zool. Inst. Univ. Wien, 1883) formed a transition to his later studies alluded to above. Among his more general writings were *Immunity from Infective Diseases, The Nature of Man and Prolongation of Human Life.* He was born in Kharkov, Russia, May 15, 1845, studied at Giessen and Munich, was Professor of Zoology and Bacteriology in the University at Odessa 1870-1882, and went to the Pasteur Institute in 1888.

An obituary notice of IGNAZ MATAUSCH (September 1, 1859—December 14, 1915) known for his papers on Membracidae and especially for the large models of insects and other invertebrates which he constructed for the American Museum of Natural History in New York, has appeared in the June, 1916, number of the *Journal of the New York Entomological Society* (received August 15, 1916).

In the *Journal of Economic Entomology* for February last, Dr. A. Böving gave an extract from Dr. C. Aurivillius' obituary notice, in *Entomologisk Tidsskrift*, 1915, of SVEN LAMPA (1839—December 2, 1914), one of the founders of the Swedish Entomological Society in 1879, editor of the *Tidsskrift*, 1891-1901, and chief of the Swedish entomological service 1897-1907. Dr. Aurivillius' notice includes a bibliography.

Miss CORA HUIDEKOPER CLARKE, born in Meadville, Pennsylvania, February 9, 1851, died in Boston, April 2, 1916, was the author of several papers on caddis worms and a successful rearer of gall-flies. A brief account of her life is in *Psyche* for June, 1916.

EXCHANGES.

This column is intended only for wants and exchanges, not for advertisements of goods for sale. Notices not exceeding three lines free to subscribers.

☞ These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and only when necessary those at the top (being longest in) are discontinued

Wanted—*Catocala* from the Western and Southern States, and Cynipidae and their galls from all parts of North America. Will identify species in return for specimens.—William Beutenmuller, 879 Whitlock, Ave., Bronx, New York, N. Y.

Wish to exchange Cicindelidae from my locality and Indiana for American and exotic Cicindelidae new to my collection.—Adolph Mares, 2524 So. Homan Ave , Chicago, Ill.

Lepidoptera—Send lists of offerta, especially North American diurnals, with a view to exchange.—Dr. John Comstock, 1275 Bellevue Avenue, Los Angeles, Cal.

Wanted—*Neophasia terlootii* and *Eucheira socialis* (Lep.) in exchange for rare South American Lepidoptera, and identified North American Lepidoptera for Argentine Hymenoptera.—Dr. E. Giacomelli, Calle Rio Negro 84, La Rioja, Argentina.

Wanted—Rare Buprestidae. Have *B. connexa* to exchange for *B. sulcicollis* or other equally rare species.—W. J. Chamberlin, Ore. Exp. Sta , Corvallis, Ore.

Wanted—Kirby, Catalogue of Odonata; Literature on South African Odonata. African insects in exchange, or cash.—Stephen Rich, Amanzimtoti, Natal, South Africa.

Wanted—To correspond with collectors in India, China, Japan, Africa and all parts of the tropics who can furnish Lepidoptera from their own territories, either in large or small lots.—S. C. Carpenter, 92 Baltimore St., Hartford, Conn.

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